STUDENTS' WORK WITH LITERARY CONCEPTS IN DIGITALLY RICH L1 CLASSROOM

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Abstract

This article explores students' learning trajectories in digitalized classrooms as they work with literary concepts in first language (L1) education. Using a multimodal conversation analysis approach, we investigate the emerging activities and epistemic stances that students take when attempting to explain and apply the concepts. Departing from socio-cultural understandings of learning as constituted in interaction, we analyze how students display their understandings with a specific interest in the role of digital resources in the evolving learning trajectories. This research data consists of video-recorded interactions from Swedish and Finnish upper-secondary school classrooms, including the students' work on their computers and/or smartphones. We demonstrate how digital resources support students in finding suitable explanations for concepts that from a pragmatic view help them solve given tasks. However, it seems that digital resources do not help students develop their everyday understanding of concepts into an academic understanding, which would enable them to apply these concepts in literary analysis.

Keywords: learning trajectories, conversation analysis, digital resources, classroom interaction, literature education, upper secondary school

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1. INTRODUCTION

In first language (L1) education, as well as in other disciplines, the use of concepts is a part of what constitutes a subject-specific language as well as its characteristic genres and rhetorical patterns (Coffin, 2006; Fang & Schleppegrell, 2010). Thus, learning to use concepts in their disciplinary-specific ways is essential for the development of academic language during education (Gibbons, 2002, pp. 4-5; Schleppegrell, 2004, pp. 21-23). In the Nordic countries, studying and learning to use different concepts are common practices especially in secondary school classrooms and a central goal in education in general (e.g., Nikula, 2017; Slotte & Ahlholm, 2017). Furthermore, in classrooms, learning concepts is tightly intertwined with the texts that are available in each learning process. Textbooks and other curriculum materials traditionally cover the central concepts of each subject and illustrate subject-specific language (Schleppegrell, 2004, pp. 139-142; see also Rørbech & Skyggebjerg, 2020). In addition to using traditional textbooks, teachers in most upper-secondary classrooms in the Nordic context have access to digital resources as students are equipped with their own digital devices, and they more or less have constant access to the Internet. Consequently, in digitalized classrooms, there might be fewer textbooks (Annerberg, 2016; Gilje et al., 2016), and the Internet may be used to provide students with additional sources of information as they strive to understand and apply the concepts that they encounter in their school assignments.

Recent studies of learning in interaction have highlighted the ways in which teachers coordinate their verbal, embodied, and material means to promote students' understanding of concepts and how students participate in interaction and orient themselves to those means (e.g., Kääntä & Kasper, 2018; Kääntä et al., 2018; Slotte & Ahlholm, 2017). In digitally rich classrooms, students seem to solve emerging task-related problems by retrieving information from the Internet and sharing information with their peers. Furthermore, many of these activities take place without teacher supervision and are largely initiated by the students themselves (Asplund et al., 2018; Juvonen et al., 2019). From a broader perspective of peer interaction and collective problem-solving, several studies have demonstrated how learning objects emerge during group work and how students manage, select, and solve these problems in interaction (e.g., Cekaite, 2009; Jakonen & Morton, 2015; Musk & Cekaite, 2017). Thus, as established in this research, the knowledge problems students are engaging with in their schoolwork may or may not be those that the teacher has initiated or provided; furthermore, students make use of their own or joint information search in their problem-solving. Regarding the students' learning of concepts, little is known about the role of digital resources as support for learning when students work with concepts in small groups or individually without the teacher's constant supervision.

In this article, we examined upper-secondary students' learning processes as they work with assignments that deal with literary concepts as part of their first language (L1) education in digitally rich classrooms. Grounded in socio-cultural

understandings of learning as socially situated in interaction (Vygotsky, 1978) and, more specifically, learning as changed participation in communities of practice (Lave, 1993; Lave & Wenger, 1991; Sfard, 1998), we investigated how students' participation in such classroom learning activities change when using digital tools as part of their schoolwork. To do this, we applied a multimodal conversation analysis approach and conceptualized learning in interaction in terms of the participants' changed epistemic stances in situated interactions (Goodwin, 2007; Melander, 2012; Tanner & Sahlström, 2018). From a data set consisting of video recordings from Swedish and Finnish upper-secondary school classrooms, we have identified instances in which students used digital devices to look for explanations of literary concepts in order to accomplish their schoolwork and selected two examples for detailed analysis.

The aim of this article is to determine the role of digital resources in students' learning trajectories about concepts in literature education classrooms with the following research questions:

- How do students display their understanding of the meaning of concepts in classroom interaction?
- What is the role of digital resources in accomplishing a changed understanding of the concepts in interaction?

2. LEARNING, LITERARY CONCEPTS AND CLASSROOM INTERACTION

From a perspective of language learning, concepts are seen in relation to the development of academic language(s) and registers. They, in turn, are abstract and cognitively demanding by nature and may differ greatly from those which students encounter in everyday contexts (e.g., Cummins, 2000, pp. 57-81; Gibbons, 2006, pp. 1-13; Schleppegrell, 2004). In his seminal work on the development of scientific concepts, Vygotsky (1986, 1987) made a distinction between such scientific concepts and spontaneous (or everyday) concepts. According to Vygotsky, scientific concepts are systematically ordered and originate from organized school instruction, whereas everyday concepts emerge from experiences from everyday life and are less structured. Hence, although understanding concepts is a necessary basis for having access to some subject-related matter, they might be inherently complicated and challenge the students' everyday understandings of the phenomena they represent (cf. Meyer & Land, 2005). Meyer and Land (2005) described these complicated but elementary concepts as "troublesome," and suggested that in literary studies, *irony* might be an example of such troublesome concepts (see also Corrigan, 2019; Johansson, 2019).

While research on learning L1 concepts and determining how to use them has become more significant recently when concerning grammatical concepts (e.g., Camps & Fontich, 2019; Myhill, 2018; Štěpáník, 2019; van Rijt et al., 2019), there are considerably fewer studies on how students learn and understand concepts that are central in literature education. However, research has demonstrated how students

enhance their interpretation and reading of literary texts with the assistance of suitable concepts (e.g., Doecke & van de Ven 2012; Wolfe 2004).

In the Finnish context, the preciseness of the concepts used in upper-secondary school literature education has been discussed. In Kouki's study on such concepts as *narrator*, *motif*, or *theme* in Finnish upper-secondary school textbooks (2009, pp. 182-189), she criticized textbooks for their insufficient definitions, inconsistent learning trajectories, and lack of theoretical transparency. Directly relevant to our study is Johansson's (2019) research, in which she explored how students in Swedish upper-secondary school understand and use literary concepts in their analysis. Johansson (2019) found out that students were able to give some correct definitions to literary concepts, but most of the definitions were incomplete and the students simply applied their everyday understanding of the concepts, not academic ones. In the think-aloud-task, the students only used a few concepts or no concepts at all (ibid.). According to Johansson (2019), the students may have some fundamental understanding of the concepts, but they struggle to verbalize and apply those concepts in a task situation (see also Torell et al., 2002).

As stated above, when learning to use concepts as part of their own linguistic repertoire, students are challenged to understand the meaning or the "content" of the concept and to learn to use it effectively (Nikula, 2017). In the context of literature education, Many (2002) observed that teachers' instructional scaffolding in classroom conversation supports students' conceptual understanding; thus, students' ability to construct meaning from texts is enhanced (see also Wolfe, 2004). Several studies in the context of second language (L2) education focused on the use of concepts from an interactional point of view, which is also of interest for our study. Recent studies of science learning showed how learning subject-specific language, terms, and concepts is challenging especially if students use their second language (e.g., Nikula, 2017; Slotte & Ahlholm, 2017). Studies that explored interaction in CLIL (Content and Language Integrated Learning) classrooms showed how teachers and students orient themselves to both the concepts at hand and the language in which the teaching and learning is conducted (e.g., English language in Finnish schools). Many of these studies have a special focus on the teachers' multimodal practices in explaining unknown vocabulary, terms, and concepts (e.g., Kääntä et al., 2018; Morton, 2015). In Nikula's (2017) study in physics education, the students' understanding develops, and eventually, the students are not only familiar with the meaning of the concept, but are also able to use the concepts and relevant vocabulary in their interaction during their physics lessons. Furthermore, these studies showed that the teachers' ways of defining and elaborating on the concepts entail various configurations of verbal, embodied, and multimodal practices. As Kääntä et al. (2018, p. 697) noted, teachers display "an overall orientation to constructing conceptual knowledge rather than building L2 vocabulary."

Since the Internet contains many materials and texts from all kinds of sources, the Internet presents an additional challenge to students trying to learn concepts in digital classrooms. According to Kiili et al. (2008), students need solid online reading

comprehension skills to understand what they find on the Internet. There is also evidence that not all students have the necessary digital competencies for online reading (Leu et al., 2011; cf. Hinostroza et al., 2018). Previous research identified locating information as "a gatekeeper skill" because it entails those first practices that are needed to find useful and relevant information online, such as generating search strings and analyzing search results (e.g., Bilal, 2000; Leu et al., 2011). Moreover, in the context of school tasks, spending more time in searching and locating information might lead to a lack of time to process the information and complete the actual task (Kiili et al., 2012). In the Finnish context, upper-secondary school students seem to face problems in many phases of their attempts to locate information (Kiili, 2012, pp. 43-44). Alongside formulating search strings and analyzing the results, the principles of search engines and regulating the search process are also problematic areas (ibid.). Another critical and challenging skill is the ability to evaluate the relevance and credibility of information. And according to Kiili et al. (2008), some upper-secondary school students struggle to find relevant information on the Internet for their schoolwork because these activities are challenging (see also Leu et al., 2011; Walraven et al., 2009).

To apply concepts in their tasks, students must process and apply the information they have found. However, previous research suggested that gathering facts seems to be the preferred way to approach online information (Kiili, 2012, p. 45). This, in turn, might explain the popularity of the free online encyclopedia Wikipedia as a primary source among students (Blikstad-Balas, 2016; Blikstad-Balas & Hvistendahl, 2013; Head & Eisenberg, 2010). In Blikstad-Balas's (2016) study among Norwegian upper-secondary school students, she showed that Wikipedia is treated as a practical and sufficient source in classrooms because of how Wikipedia is used and the literacy practices in classrooms are, in some respect, compatible (see also Walker & Li, 2016). Thus, the given instruction has a central role in the students' performance. Kiili et al. (2012) suggested that a task that requires comparing sources and building up an argument collaboratively seems to enhance students' information processing. Moreover, Hinostroza et al. (2018) showed that students monitor the task and make choices either to copy-and-paste or to rephrase the source. In addition, according to some observations, further processing of the content of sources seems to be more successful if students are working collaboratively rather than individually, at least when an argumentative task is at hand (Kiili, 2012, pp. 45-46; Kiili et al., 2012).

To summarize, previous research indicated that learning concepts in digitally rich classroom settings entails complex activities such as locating and evaluating information, making sense of the subject-specific language, differentiating the everyday use of a concept from its academic use, and applying the concept in customary ways when accomplishing school tasks. When working with tasks that demand the learning and understanding of concepts, digital literacy skills are essential. In a classroom context, these occur and emerge within interaction between students and teachers as well as students and their peers when working collaboratively. However, research on how upper-secondary school students learn

and understand literary concepts seems to be quite rare. Particularly scant is research on how students use (digital) resources while working with these concepts. In this article, we aim to contribute to a deeper understanding on how students use digital resources in learning trajectories when working with literary concepts. In doing so, we took a multimodal perspective on interaction and recognized the interactional complexity of working on a joint task in classroom settings.

3. THEORETICAL FRAMING

This study is based on the socio-cultural understandings of learning being framed as changed participation in social interaction (Lave, 1993; Lave & Wenger, 1991; Sfard, 1998) in specific classrooms and L1 education contexts. Sfard (1998) compared two different metaphors for learning—learning as acquisition and learning as participation—and clarified how learning as acquisition rests on an essential understanding of knowledge as transferable from teacher to student, which Sfard argued is a dominating view on learning. As a result of the so-called social turn, scholars such as Lave and Wenger (1991; see also Lave, 1993) developed theories of learning in terms of learning in interaction and as "changing participation in the culturally designed settings of everyday life" (Lave, 1993, p. 6). In a similar way, Cobb and Bowers (1999) argued the importance of studying individual student's learning in classrooms as participation in social interaction. Such a perspective, they claimed, makes it possible to take both individual and social dimensions into consideration in the multifaceted and institutionally framed processes of classroom interaction. From a pragmatic view, the completion of different tasks and assignments involves institutional expectations of problem solving, completing papers, and behaving in certain ways in relation to different kinds of texts (Tainio, 2012; Tanner, 2017). Besides schoolwork, students are engaged in social projects with their peers, sometimes in parallel or in competition with the teacher's task-related expectations (Olin-Scheller et al., 2018).

As we approached the analysis of these complex and multifaceted interactions, we applied a conversation analytic (CA) approach in our investigation on students' participation and learning trajectories while working with school assignments about subject-specific concepts in the context of L1 education. From this perspective, issues of learning and knowing have been explored in terms of epistemic aspects, which are shown to be ubiquitous dimensions at the core of human sociality (Heritage, 2013; Heritage & Raymond, 2005; Goodwin, 2013).

In line with previous research in the field of CA on learning, specifically in classroom interaction (e.g., Jakonen & Morton, 2015; Lee, 2010; Pekarek Doehler, 2010; Sahlström, 2011), we understand learning as something that is socially constituted and is composed of practical accomplishments in face-to-face encounters between students and teachers in relation to the material and social dimensions of the classroom context. In the analysis, we specifically drew on interactional research that focused on how learning trajectories develop in

classroom interaction (Melander, 2012; Rusk et al., 2017; Sahlström, 2011; Tanner & Sahlström, 2018). From an emic perspective, those trajectories were analyzed with a focus on contingent changes in the participants' demonstrated epistemic stance in relation to certain learning content. The concept of an epistemic stance has been developed within conversation analytic research about the role that issues of knowledge have in interaction (Heritage, 2013; Goodwin, 2013; Kärkkäinen, 2006). Kärkkäinen (2006) described an epistemic stance in terms of how the degrees of engagement or attitudes toward knowledge are marked by participants in a conversation, how claimed knowledge is accounted for, and how knowledge has been constructed. Tanner and Sahlström (2018) showed how explicit topicalization of the issues of knowing and learning is a salient resource for participants to simultaneously accomplish cohesion as well as change in a learning trajectory. Through epistemic topicalizations, participants display their moment-by-moment understanding of a certain learning object that makes epistemic stances public and available for others' response. Furthermore, in our understanding, an epistemic stance is not only accomplished through talk-in-interaction but must also be seen from a multimodal perspective as students and teachers coordinate verbal and non-verbal interactional resources such as bodily stance, language, and material structures (Goodwin, 2000, 2007; Mondada, 2014).

This article focuses on specific phenomena in classroom learning trajectories that emerge as upper-secondary students use digital resources as they work with assignments about subject-specific concepts in Swedish (which is the participants' L1 in the school context). We focused on how students' epistemic stance is constructed, demonstrated, topicalized, and subsequently changed in learning trajectories when students work on tasks about literary concepts that involve digital resources. As students work, different knowledge problems occur, and students would try to solve them with support from different available resources such as digital media, peer interaction, and the teacher. Jakonen and Morton (2015) described such instances as Epistemic Search Sequences (ESS), which is defined as "interactional sequences in which students identify and attempt to resolve knowledge gaps that come up in the course of completing content tasks set by the teacher" (p. 74). A knowledge gap occurs when students find that they lack some necessary information to continue with a task. On such occasions, students often turn to their peers and/or other resources nearby to solve the problem and complete the task, and "to do so, they publicly discover, and work on, items to be known, at the same time orienting to different rights and responsibilities related to states of knowledge" (Jakonen & Morton, 2015, p. 75). As the students in our examples worked with assignments about concepts, they identified knowledge gaps that they needed to fill, resulting in instances of ESS as a central part of the learning trajectories that develop.

4. DATA AND METHOD

In the analysis, we used video data from two larger corpora of fieldwork conducted over two years. The data were collected in two parallel research projects, Textmöten (Finland) and Connected Classrooms (Sweden), using a video-ethnographic approach that followed several focus students' use of smartphones and computers during lessons.[1] Both projects focused on the role of smartphones and other digital devices in learning and social interaction in the classrooms (see Sahlström et al. 2019 for further elaboration of the methods in these projects). The data consist of video-recorded face-to-face interaction and simultaneous recordings of screen-mirrored smartphones. In addition, we recorded the students' activities on computers and/or with pen and paper during their lessons. We observed classroom activities in three upper-secondary schools in Sweden and Finland, resulting in a total of 158 hours of video-recorded lessons (i.e., approximately 45 hours of Swedish materials and about 113 hours of Finnish material). The Swedish students attended theoretical programs in the second and third (final) grade (17-18 years), and the Finnish students (aged 16-18) all attended general upper-secondary schools ending with final exams. We followed lessons of various subjects (e.g., mathematics, history, social studies, as well as languages). Data were viewed and coded for instances when the focus students used smartphones or laptops. In this article we focus on L1 lessons (i.e., Swedish) and have scrutinized those lessons to find examples related to our aim.

As the aim with this study is to investigate learning trajectories that relate to concepts in literature education, we searched for instances in the material where the use of concepts was explicitly topicalized as a learning object in L1 lessons in combination with the use of digital resources. While concepts are quite often at the center of the lesson in many subjects, this in combination with the focus students' use of digital resources proved to be quite rare in our data, but our search resulted in two clear examples from concepts in literature studies, namely *farce* (Swedish *fars*) and *satire* (Swedish *satir*).

As described in the theoretical framing, we used a multimodal conversation approach (Goodwin, 2000, 2007; Mondada, 2014) to analyze how students, during interaction with peers, teachers, and available material structures, demonstrate a changed understanding in terms of epistemic topicalization and changed epistemic stance. The multimodal approach in the analysis considers how participants in their social interaction use and coordinate different verbal and non-verbal resources, such as talk, gaze, bodily stance, and gestures in relation to the material and contextual aspects of their surrounding environment (Goodwin, 2000, 2007). Furthermore, we analyzed the activities on the students' screens and followed how their work and writing unfolded within an ongoing interaction (see Mondada & Svinhufvud, 2016).

[1] *Connected Classrooms is financed by the Swedish Research Council (Research Grant 2015-01044) and Textmöten is financed by the Swedish Cultural Foundation in Finland.*

Hence, the selected examples were transcribed with an aim to represent the multimodal nature of the students' work in interaction. For verbal interactions, we mainly relied on basic transcription conventions in CA developed by Jefferson (2004), marking with the speakers' first three letters in their names in upper-case letters. To represent non-verbal interactions, we relied on conventions developed by Mondada (e.g., Mondada, 2014) where multimodal details of the interaction are described and delimited in parallel lines directly under the verbal conduct as well as integrated images from the video-recordings (which are shown as drawings in this article) and screen-captures. Non-verbal conduct is tied to different participants using lower-case letters. In the transcriptions, we showed the original verbal interactions conducted mainly in Swedish, but for the reader's convenience, we used English translations in the analysis.

5. FINDINGS

In this section, we present the results of our analysis. We have organized our findings into two parts. In line with previous research (see Johansson, 2019; Torell et al., 2002), we have distinguished between tasks that merely require explaining a concept (i.e., the first example) and tasks that also require applying a concept as part of a literary analysis (i.e., the second example). As our following analyses show, these tasks differ in their complexity. As an activity, applying a concept requires at least an underlying knowledge of the content of the concept and the ability to explain it; thus, during a literary analysis, an emerging Epistemic Search Sequence (EES) may relate to the explaining or using of the concept to a varying extent. To fully describe the learning trajectories in our data from this angle, we will follow a longer passage of students' work in the second example. Both analyses begin at the point where the concept at hand is first explicated and right before the ESS is initiated.

5.1 Explaining concepts: What is a farce?

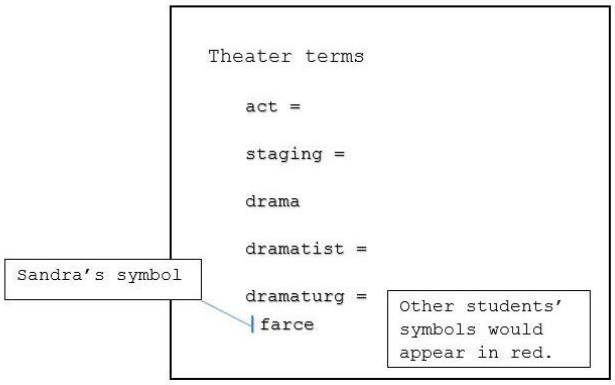
Our first example is from a lesson that focused on drama and the history of theater. In this example, we visit a class that had worked with this topic for a few lessons, so that the students were expected to be quite familiar with the topic. In the studied lesson, the teacher had compiled a list of words that relate to drama and theater; she had titled the list *Theater terms* (Swe. *teatertermer*). Thus, the task was presented as being about terms, and these terms presupposed knowledge about concepts related to literature education. In the moment we have selected, the concept in question is *farce* (Swe. *fars*), which stands for a genre of comedy in theater and drama.

The teacher shared the list of terms on a digital writing platform and divided the list in sections. The teacher also divided the students into groups, and each group was supposed to work with their part of the given terms. The task for the students was to explain those terms from their part of the list. Later in the lesson, the students

did a quiz as a class by matching the terms with their appropriate definition. In this first phase, on which we are focusing, the students used laptops and were free to search on the Internet to accomplish the task. Moreover, the teacher instructed the students to discuss the words they had on their list and agree on their explanations.

In Excerpt 1, we are following a student who goes by the pseudonym Sandra. The data we are using allow us a viewpoint on Sandra's work, but no access to the works of the rest of the class. Hence, we analyze how Sandra navigates through the task. Sandra's work begins when she starts to edit a digitally shared document. At the beginning of the work, Sandra has verbally announced which concept she is about to explain and she has added one explanation in the list. Sandra sits next to a peer, and the students work together as a larger group on the writing platform. The students' seating arrangement does not form a shared table where they would sit facing each other. On a writing platform, however, the students can see each other's symbols and editing (see Fig. 1). Our Excerpt 1 begins when Sandra announces that she is going to explain the word *fars* ('farce').

Figure 1. The task. English translation. The students' answers are omitted



Excerpt 1

1. San: fars +(1.5) #jag tar fars
   farce (1.5) I'll take farce
   san w: +=
   san c: #copies *fars* 'farce' from the document
2. (not available)
3. SAN: jep# (0.8) because I can relate #
   yea
   san c: #to web browser #pastes *fars* 'farce' to the address line
4. (4.5) (Fig. 2)

Figure 2. Farce

5. SAN: en (.) .hh #(2.2) när något int funkar (Fig. 3)
a (.) .hh (2.2) when something doesn't work

Figure 3. When something doesn't work

6. (8.6) (Fig. 4)
san c: search string 'the theatre became a farce'

Figure 4. Theater became a farce

7. SAN: skrivs int fars (0.9) #med två (1.9) nä↑ (Fig. 5)
don't you write farce (0.9) with two (1.9). no
8. *san c:* *#the theatre became a farce'*

Figure 5. Farce underlined

9. (32.5)
san c: search string *en fars* → The Swedish Wikipedia, *fars* ('farce')
san w: copies 'Farce is a type of comedy, which is based on situation comedy,' pastes to the shared document

 # delimits actions on laptop made by Sandra (SAN), + delimits writing made by Sandra (SAN), w = Sandra's (san) writing, c = Sandra's (san) actions on laptop. Search strings are squared in the figures.

At the beginning of our excerpt (line 1), Sandra orients to her laptop screen and after a few seconds, makes a verbal announcement about which concept she has chosen. The possible response is not available in our data, but in her turn, Sandra produces a particle of agreement (Swe. *jep* 'yea, yes', line 3). Additionally, she explains her choice of task, 'because I can relate.' Sandra's explanation, which she produces in English, works as a claim about having some experience of the concept of farce; thereby, she takes an epistemic stance as understanding what it means. However, although she claims to have a preconception of the concept, Sandra turns to the Internet to search for additional information, indicating a knowledge gap that initiates an ESS (Jakonen & Morton, 2015), in which the computer is an available resource.

Sandra begins her search for information by copying the word *fars* ('farce') from the shared document and pasting it in the address line of the web browser. The web browser Sandra is using has a search engine integrated in the address line. The search engine provides suggestions unrelated to the task. The combination of letters fars forms the Swedish word for 'farce', but in other contexts, it also refers to a news agency and to an Iranian province as well. Sandra's gaze is on the screen (Fig. 2), but

she does not select any of the links and rejects the suggestions by reformulating another search string (line 6).

Sandra produces aloud an indefinite article en (‘a’). After a pause, she produces a candidate explanation that elaborates her preconception, ‘when something doesn’t work’ (line 5). Although Sandra is speaking aloud, she does not seem to address her turn to a particular peer. Her gaze wanders from her screen to her right side and back to the screen (Fig. 3). In regard to the content, Sandra’s formulation can be seen as a metaphoric understanding of the word farce; a farce is a somehow absurd or unsuccessful situation. What the formulation does not encompass is the conceptual, literary dimension of the word farce since a farce is not referred to as a genre name. So far, her searches have not helped to close the knowledge gap initially indicated, and Sandra displays an epistemic stance of uncertainty verbally (line 5).

Sandra’s next formulation for the search string is ‘the theater became a farce’ (Fig. 4). It narrows the search scope by adding a reference to theater but also seems to refer to her pre-conception of farce as a situation that turns into a mess. This time, the search results in some suggestions that relate to theater, and the results entail not only homepages of theaters, but also other miscellaneous suggestions such as a Wikipedia article on one of the past monarchs of Sweden. Sandra looks at the search results for a while and produces a question about the spelling of the word farce and frowns (Fig. 5, line 7). Since Sandra now orients to the possible misspelling of the term, she evaluates the search results as problematic. Moreover, alongside her verbal formulation—a question—her facial expression conveys an epistemic stance of uncertainty; the results do not seem to be as expected, and the problem is in spelling. Again, she does not seem to direct her verbal turn to her peers: her turn is syntactically incomplete and lacking a part of the adverbial clause (‘with two Ø’). There is also a pause when Sandra edits her spelling.

In lines 7-8, Sandra edits the search string by adding the letter *s* in the Swedish word fars ‘farce.’ The search engine marks the word as misspelled with a red line (see Fig. 5). The red line works as a negative response to this trial, and Sandra produces a negative evaluation ‘no,’ which is sequentially a response to her own initial question (line 7). After unsuccessfully editing the spelling, Sandra goes back to the previous search string (‘theater became a farce’) and examines the results for over 30 seconds. She scrolls through the search results but does not click on any of them. Sandra is still frowning as if the selection of links is somehow problematic, as none of the results seems to meet Sandra’s expectations since she does not open the websites. So far, the online resources have not helped in closing the knowledge gap in this ESS.

With her last search string, en fars (‘a farce’), Sandra returns to a simple one-word search string like the first one but adds an indefinite article en (‘a’) (line 9). Unlike the first results, the search at line 9 results in a Swedish-language Wikipedia page for the word farce. Sandra clicks the link to a Wikipedia page, copies the first sentence of the body text (‘Farce is a type of comedy, which is based on situation

comedy') and pastes it in their shared document (line 9). Thus, after finding a suitable source, she can complete the ESS by quoting the source.

Excerpt 1 shows an ESS where Sandra's epistemic stance successively changes from claiming to relate through a displayed uncertainty in relation to formulating the search string until she can finally solve the task and close the knowledge gap. Her epistemic stance is displayed through both verbal and embodied means throughout the sequence. Before editing the search string, she verbalizes her candidate understanding of the term (line 5), and after inapplicable search results, she claims uncertainty by questioning the spelling of the search word (line 7).

As a task in L1, the challenge in pragmatic terms for the student here is to locate the needed information and find a suitable answer to fill in the document. With a search string fars ('farce'), Sandra faces a problem when the search engine suggests unsuitable results. In her process, the evaluation of the relevance of the search results becomes visible (Kiili et al., 2008; Leu et al., 2011). The turns (lines 3 and 5) that reveal the metaphoric or everyday understanding of the concepts make the challenges to formulate suitable search words visible. When a one-word search does not deliver the expected results, the student would need a way to narrow the scope of the search. Sandra solves the problem by adding the word theater into the search string. However, the other words of the search string echo the broader understanding of the word ('became a farce'), and consequently steer the search to another direction. The last search string, en fars ('a farce'), reflects successful problem solving. With an indefinite article, Sandra rules out the proper nouns from the results, and the Wikipedia article appears. Moreover, with an indefinite article, the search word refers more precisely to a concept of a genre.

In Excerpt 1, Sandra works with other students on a shared writing platform. The progress of her peers' work is visible to her on their platform and vice versa; her peers can see her actions. During the moment we have analyzed in Excerpt 1, after the first turns, Sandra does not engage in interaction with her peers outside the platform. According to our analysis, with her verbal turns (lines 5 and 7), which are not apparently addressed directly to some of her peers, Sandra seems to steer her own action in the information search by thinking aloud. However, it is plausible that the EES in Sandra's action is available at least to the student sitting next to her, and by verbal and embodied means, Sandra conveys her epistemic stance and change to her neighbor whether the neighbor responds or not.

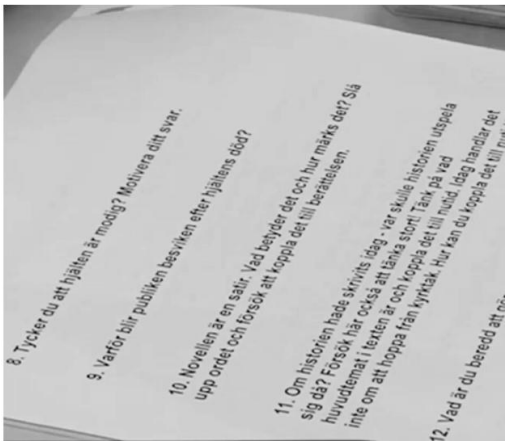
As a general observation, Sandra's course of action in accomplishing the task follows a certain routine in each part of the task. She copies a term from the list into the search engine, and she performs the search. When a suitable Wikipedia article appears, Sandra uses it as a source. From a pragmatic view, the emerging task appears not to be about formulating the explanations but finding a working explanation to quote. Wikipedia pages offer definitions suitable for a task that requires them, and when Sandra copies them as they are, she seems to have found an effective way to work with the task during this moment we have analyzed. The popularity of Wikipedia in classrooms is no news (cf. Blikstad-Balas, 2016). However,

the routine activity that leads to using Wikipedia as a source is interesting. Based on Sandra's actions and the emerging ESS, we can argue that the task is interpreted to require more information gathering than term discussion, even though the teacher has instructed otherwise. Thus, this emerging learning trajectory does not concern joint meaning making of the concept of farce, but rather discovering a suitable search string. One possible conclusion is that activities of gathering information show the tenacity of common and recurrent literacy activities in classrooms, such as copying text passages from the textbook when answering questions. In digitalized classrooms, relying on ready-made texts is at least tempting since, as noted by Skaar (2015), using text on the Internet as part of the writing allows students to control their workload and their engagement with the task. Finally, it is noteworthy that in the context of this lesson, the task is completed with a joint quiz, and our focus student may have interpreted the explanations more as standard quiz answers where the correctness of the answer is more central than the process of joint academic elaboration.

5.2 Explaining and applying concepts: What does satire mean?

Compared to the first example about farce, our second example is from a student task with a somewhat higher complexity as the students were supposed to both explain a concept and apply it in a text analysis. The example comes from a Swedish classroom where our focus student Sigrid was collaborating with three peers on questions for a classic short story that the class has read together, "A hero's death", which is "*En hjältes död*" in Swedish. The story was written in 1924 by an established Swedish author, Pär Lagerkvist. It is about a small town where a young man is tricked into taking a bet that he will get 500,000 Swedish crowns if he dares to jump from the church tower. The people in the small town are excited, and the man becomes a celebrity. However, it all ends abruptly when the man, as the reader could expect, falls from the tower and dies. The story can be read as a satire about how greed and media-hypes stop people from reflecting and cause them to follow the crowd without thought. In the studied lesson, the teacher had given the students a worksheet with questions about the text, and they wrote down answers to the questions on a separate piece of paper. This example shows the discussion on question number 10, where the students were supposed to first look up and explain what the term satire means, and then apply it by making connections to how it is manifested in the text (Fig. 6). Compared to the first example, this task generates a longer stretch of both verbal and non-verbal interaction as the students cooperate in solving the task. Hence, to capture how the students' epistemic stance changes, the transcriptions and analysis are longer and more verbally oriented.

Figure 6. The task. 'Question 10: The story is a satire. What does that mean and how does it show? Look up the word and try to make connections to the story.'



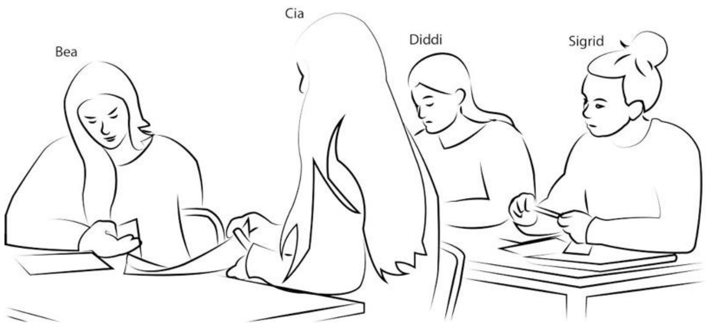
In the following excerpt, the students have finished answering question nine and are about to start solving question 10. Sigrid begins a conversation that initiates a new ESS in relation to the concept in question, 'satire.'

Excerpt 2

1.	BEA:	*okej*
		okay
	bea:	*moves the phone closer to her body*
2.	SIG:	* #vad be tyder det där ordert efter-
		* *#what does that word mean after-*
	sig:	#looks at worksheet
	bea:	*looks at her phone screen->
3.	BEA:	#satir↑
		#satire↑
	bea:	-->-->-->-->-->->
	sig:	#looks at bea-->-->
4.	SIG:	vad är dat
		what is that
	bea:	-->-->
5.	BEA:	Är en littär uttrycksform vars syfte är att för[löjlliga=.]
		a literary expression aiming at making rid[icule=]
	bea:	-->-->-->-->-->-->-->-->-->-->-->-->-->-->--> (Fig. 7)
	sig:	-->-->-->-->-->-->-->-->-->-->-->-->-->-->-->
6.	CIA:	€[det står här]
		€[*it says here*]

cia: €points at her sheet

Figure 7. Bea, Cia and Sigrid turn towards each other



7. BEA: =eller håna någon eller #något ofta på ett* elegant och träff* ande=
=or taunting someone or #something often in an elegant and to the point mode=
bea: -->-->-->-->-->-->-->-->-->-->-->-->-->-->--* looks at SIG->->-->* looks at CIA
sig: -->-->-->-->-->-->-->- #looks down at question

8. BEA: =sått*
*=mode**
bea: ->->-*

9. CIA: #*€>det står här<# satir drift #med någon * eller något €#
#*€>*it says here*<#* *satire making fun of someone or something*€#
cia: €lifts up worksheet and points while reading aloud
bea: *looks at Cia's sheet -->-->-->-->--> -> ->*
sig: #looks at CIA# # frowns and looks up #

10. BEA: ja men det var ju (°det hår typ°)
but hat was what (°*sort of*°)
11. SIG: jag förstod inte ensdet dår
I didn't even understand that

*# delimits actions made by Sigrid (SIG), * delimits actions made by Bea (BEA), € delimits actions made by Cia (CIA), -->--> delimits action that continues over several turns. Search strings are squared in the figures.*

In the first line of Excerpt 2, Bea directs her attention to question number 10 (about the concept satire) and says, 'okay,' after which she moves her phone closer and unlocks it to use. In line 2, Sigrid also orients to the question and asks, 'what does that word mean after.' Her question is an epistemic topicalization, displaying an unknowing epistemic stance to the concept; thus, she identifies the knowledge gap (Jakonen & Morton, 2015). Before Sigrid has finished her question, Bea takes over and fills in the word 'satire' (line 3), emphasizing it with a raised intonation while still

looking at her smartphone screen. Sigrid reformulates her question, 'what is that' (line 4), and Bea responds by reading aloud from her screen, 'a literary expression aiming at making ridicule or taunting someone or something often in an elegant and to the point mode' (lines 5 and 7). Her immediate response reveals that the text was already on her screen; therefore, she had already begun to search for an explanation with her phone.

While Bea reads from her screen, Sigrid's gaze is directed to her until she has read the entire explanation (lines 3–7). Bea and Cia sit facing each other, and Sigrid is looking at Bea who is sitting in front of her so that their bodies form a collaborative configuration (Goodwin, 2000). Overlapping with Bea's reading aloud, Cia adds to Bea's turn that it also 'says so here' (line 6), referring to another explanation that is given on the worksheet. Sigrid looks down at her own worksheet, but at the question and not the explanation that Cia points to (line 7). When Bea has finished her reading, Cia takes the floor by quickly repeating '>it says here<,' as she lifts her sheet higher, points again, and continues to read the explanation on the printed worksheet, 'making fun of someone or something' (line 9). Bea and Sigrid both look at Cia while she reads, and after Bea responds to Cia with a slight objection with a very soft voice that is difficult to hear but indicating that this was what she just said. In response to these two candidate explanations from Bea and Cia, Sigrid concludes in line 11, 'I didn't understand,' an explicit epistemic topicalization that marks her still unknowing stance in relation to the knowledge gap that initiated the search.

Excerpt 2 shows how the students form a bodily constellation where their bodies' orientation and their gaze directions make possible a joint stance to the explanations as a shared learning object in this activity (Goodwin, 2007). Bea and Cia, who are sitting in front of Sigrid, have turned their bodies toward each other and Sigrid has raised her head with her gaze directed not only to her peers as they read, but also to the worksheet. Bea's phone becomes a resource for her to be the first to answer Sigrid's question, as she has already picked it up and begun to search. Thus, she positions herself epistemically as knowing in relation to the others. Cia, however, uses the printed worksheet as a kind of invitation to the others to use the source they have been provided on there. From different sources, Bea and Cia have now presented two similar but competing explanations to Sigrid's question. However, Sigrid does not confirm that she understands any of them but concludes that she still does not understand. Hence, the knowledge gap that Sigrid's first question has identified remains.

As the interaction continues in Excerpt 3, a fourth student Diddi enters the floor, and Sigrid picks up her phone and begins to search for an explanation herself:

Excerpt 3

12.	DID:	va? (0.5) #drift med något eller någon
		what? (0.5) #mocking with something or someone
	sig:	#starts browsing her phone screen (Fig. 9)

((SIG, CIA and BEA all looks at their screens for 16 s, SIG searches makes searches for 'satir' (Fig. 8))

Figure 8. Sigrid's phone. A part of Google search results for satir *'satire' (a screenshot of the data.*

13. SIG: hoj (0.6) #varför kom λhan upp
hoy (0.6) # why did λhe come up
sig: #shows phone screen to DID (Fig. 9) -->
did: λlooks at SIG's screen -->-->

Figure 9. Sigrid's phone (a screenshot of the data). Satire *on Swedish Wikipedia, with picture of the TV host. (Picture of Stephen Colbert by David Shankbone, CC BY-SA30.)*

14. BEA: ja *man driver-
*yes*you make fun of-*
bea: *puts down her phone, looks at SIG and DID
did: ->λ
sig: ->#
15. SIG: ha ha
ha ha

16. (1.5)

17.	DID:	#λ va sa'ru bea
		#λ what did you say Bea
	did:	λ looks at Bea
	sig:	#looks at her phone
18.		(0.8)
19.	SIG:	att man <u>driver</u> med nån typ
		that you sort of <u>make fun of</u> someone
20.	BEA:	ja
		yes
		((ca 4.3 s silence, Sigrid closes the web page and puts down the phone))

*# delimits actions made by Sigrid (SIG), * delimits actions made by Bea (BEA), € delimits actions made by Cia (CIA), λ delimits actions made by Diddi (DID), --->--> delimits action that continues over several turns. Search strings are squared in the figures.*

At the beginning of Excerpt 3, Diddi positions herself in an unknowing epistemic stance to the explanation that Cia has just provided. Diddi says 'what' with a questioning intonation, and she continues after a short pause to repeat what Cia has just read aloud from the worksheet, 'mocking someone or something' (line 12). Simultaneously, Sigrid takes out her phone and begins to search for information. She clicks on the icon for Google and types the word *satir* ('satire'), getting a list of search results with a link to Wikipedia at the top (Fig. 8). Sigrid begins to read silently the text that has the same wording as the one that Bea read initially. While she is doing this, Bea and Cia also look silently at their respective smartphones (line 12). After a few seconds of reading, Sigrid clicks on the link to the Wikipedia page, which changes the screen-view, and a presentation of a famous satirical TV show host Stephen Colbert comes up. Sigrid's first comment to this is stressed '<u>*hoy*</u>', and after a marked silence, she shows her screen to Diddi and continues, 'why did <u>he</u> come up' with an emphasis on he (line 13). The formulation and prosody of Sigrid's comment displays astonishment. The emphasis on 'he' shows that she recognizes this specific person, and the why question construes the context of the picture as unexpected. Diddi looks at the picture but does not respond verbally. After this, Bea repeats what they have said—'that you make fun of'—(line 14), while Sigrid laughs in relation to the picture she has shown (line 15). After a moment of silence (line 16), Diddi turns to Bea and asks, 'what did you say, Bea' (line 17). Bea does not answer immediately; instead, Sigrid responds, 'that you like make fun of someone' (line 19) followed by a short confirmation from Bea, 'yes' (line 20).

Now all four students are engaged in the ESS related to the meaning of the concept *satire*, and at least three of them use their own phones that lie easily accessible on their desks (the fourth student is sitting behind and is not visible in the recording at this moment). From her reaction in line 13, Sigrid seems puzzled by the image of the TV host. Even though she recognizes him, she does not seem to find a

connection to the concept of satire. Analyzing this conversation, we can see that the question that puzzles Sigrid could have been an opening to a further discussion about why a picture of Stephen Colbert is used as an illustration of satire. Such discussion could have deepened their understanding of satire as a literary genre, but neither Sigrid nor her peers take this opportunity to investigate this new dimension. Instead, they return to the verbal explanations that are already given.

The analysis here displays an interesting difference between the students' responses to an image and to written texts. Written texts are comparably easier to translate into a written answer, as is requested in most cases. On the other hand, an image is a non-verbal resource that requires much more effort from the students to translate into words that could be written as an answer. Verbal sources are therefore less demanding to transform into a written answer to solve the task. Using the image as a source for a changed understanding would probably have required more support in this situation. We concluded that in the interaction so far, the students seemed to have found verbal phrases that work as explanations of the concept, which was the first part of the task and the knowledge gap that Sigrid first initiated. In the fourth excerpt, they put their phones aside and begin to make connections to the text, which is the second part of the task that requires their application of the concept in an analytic discussion about the text.

Bea (line 22) orients to the text of the short story and says, 'but <u>they</u> made fun of <u>him</u> or he made fun of,' referring to the protagonist. Here, she uses the explanations they have found earlier to make a connection to the text, which is in line with the task. Diddi responds to her suggestion by asking, 'was it not a company' (line 23). After a marked silence (line 24), indicating that this was an unexpected response, Bea answers, 'what' (line 25). The silence before Bea's response could indicate a lack of understanding; Diddi responds by initiating a self-repair (Kitzinger, 2013) and elaborates on her question, 'was it not a company that wanted him to' (line 26). Sigrid also turns to Diddi and takes up the task sheet. After yet another marked silence (line 27), Diddi elaborates on her suggestion further and refers to the text's description that 'they made <u>money</u> on people that (wanted to) <u>buy</u> and produce'. Bea responds to this with, 'yes oh,' which is a change of state-token that displays that she now understands Diddi's suggestion (line 29). In parallel to Bea and Diddi's dialogue, Sigrid begins to read the text (line 28). In line 31, she looks up and concludes, adding to the dialogue, 'it never says wherefrom he should get (.) the money.' She looks up again, and Diddi responds with a 'no,' and begins to read her own text. Here, it seems as if Sigrid has not understood the implicit, satiric point of departure in the text.

Excerpt 4

21.		((approx.. 4.3 s silence, Sigrid closes the web page and puts down the phone))
22.	BEA:	men dom drev ju med han eller han rev ju med- *but they made fun of him or he made fun of-*
23.	DID:	vare inte ett företag *wasn't it a company*
24.		(0.5)
25.	BEA:	va *what*
26.	DID:	vare inte ett #företag som ville typ att #han skulle- *wasn't it a company that wanted him to-*
	sig:	#turns to DID #picks up the text
27.		(1.0)
28.	DID:	de tjånan ju pengar på: folk som (vill) köpa och producera *#they made money on: people that (wanted to) buy and produce*
	sig:	#looks at the text->-->->-->->-->->-->->-->->-->->-->->-->
29.	BEA:	jaha *yes oh*
	sig:	->-->
30.		(2.1)
31.	SIG:	det står aldrig varifrån #han skulle få (.) pengarna *it never says from where #he should get (.) the money*
	sig:	->-->->-->->-->->--> #looks up
32.	DID:	(nä) *(no)*

In Excerpt 4, the students turn back to the text itself to find clues that could help them apply the concept of satire in relation to the short story, as in Bea's turn in line 22. However, the explanations they have found do not really help them since they seem to have difficulties interpreting the satiric point in the story that is implied in the text. Diddi's suggestion in line 23 is a shift of topic that identifies a new knowledge gap in relation to the plot in the text, and a new epistemic search sequence is initiated in relation to the plot.

At this point, the teacher, who is moving around in the classroom, approaches the group to check on how their work is developing in general (not shown in transcript). She then asks them explicitly if they are stuck on anything:

Excerpt 5

		((Lines 33–37 omitted))
38.	TEA:	Fastnade ni på #nåt
		did you get stuck on #anything
	sig:	#looks at the teacher
39.	BEA:	(nej eller-)
		(no or-)
40.		(ca 4.5 s)
41.	BEA:	det här med satir fast- ja
		this is about satire but- well
43.	SIG:	det är väl att typ så hä:r a:: håna nån eller typ så här-
		is it not like thi:s e:: taunting someone or like this-
	tea:	looks at SIG
44.	TEA:	ja man driver ju med nåt
		yes you make fun of something
45.	SIG:	ja
		yes
46.	TEA:	texen är jus om en drift av vad nu äre han-
		the text is like a banter with whatever he is-
47.	SIG:	av han
		of him
48.	TEA:	jaa: för att å liksom tanken vad äre han- vad vill han med-
		ye:s because he like the thought is what is it he- what does he want-
49.		=om man tanker sig
		=if you think about it
50.	SIG:	men dom drar ju nöj-de drar ju nöje av at than typ ska göra
		but they are making fun- they are making fun of that he like is going to do
51.		=nåt typ farligt
		=sort of something dangerous

Bea is the one who first answers the teacher's question with hesitation in her voice, 'no or,' (line 39) and after a marked silence, she turns to Sigrid and Diddi and continues, 'this thing about satire but- well' (line 41). The hesitance that Bea shows could refer to an uncertainty on whether or not they are actually stuck on this task, and Sigrid invites herself to the next turn and gives a candidate answer to explain the concept, 'is it not like this taunting someone or like this' (line 43). In this turn, she uses a word from the Wikipedia page, 'taunt' (Swe. *håna*), and tries out an explanation on the teacher. Hereby, she makes an epistemic topicalization of her

current understanding where she marks some uncertainty with the Swedish particle *väl* ('probably') but still claims to have a candidate explanation that she did not have at the beginning of the conversation. The teacher confirms in slightly different words that it is about making fun of something (Swe. *driver*) (line 44), and after a confirming response from Sigrid, the teacher continues to relate to the text that it is, 'a banter with what is it now he.' The teacher interrupts herself and Sigrid can continue, 'of him.' The teacher then makes a connection to the text and elaborates on how 'the thought is what is it he—what does he want—if you think about it.' However, Sigrid's response is not directed to what the protagonist wants as the teacher suggests, but instead she uses the previously mentioned explanation and makes a connection to villagers, pointing at how, 'they are making fun-they are making fun of that he like is going to do sort of something dangerous' (lines 50-51).

In this example, the students engage in an epistemic search sequence (ESS) about the literary concept *satire*, a word they all have displayed uncertainty about, and that Sigrid at the outset orients to as a knowledge gap in relation to solving the task as she asks what it is. At the end of this ESS, as the students demonstrate their understanding to the teacher, they take on a more knowing epistemic stance where the knowledge gaps are downplayed compared to earlier. Bea even seems uncertain about whether it is actually a problem anymore, and Sigrid makes a candidate explanation using the expression from the Wikipedia page, which seems good enough to gain the teacher's approval.

Compared to the first example, the students in this example explicitly collaborate in solving the task, which involves both explaining and applying a concept. They all turn to their personal smartphones as support, which is a common practice in digitally rich classrooms (Juvonen et al., 2019). Hence, even if they collaborated in solving the task, they all choose to make their own personal searches instead of just sharing the screen of one student. The small size of a smartphone screen in combination with accessibility as everyone has a smartphone makes it easy to look up information on their own devices. As for the first part of the assignment, explaining the concept, the phones became an additional source that helped the students to solve the task. As for also applying the concept, which was the second part of the assignment, the screen-mediated information seeking was not that helpful. We noticed that the multimodal character of the screen-mediated text raised Sigrid's interest as she recognized an image. However, the students did not use this puzzled interest to discuss the meaning of the concept further; instead, they relied on the rather sparse everyday understanding of satire as making fun of something. Neither did the teacher develop the explanation further, and it seemed that the connections that they made in applying the concept to the text analysis remained on the level of everyday use rather than on understanding satire as a literary genre. Thus, the analysis shows that the students eventually did take on a changed epistemic stance towards the knowledge gap that initiated the search, but in terms of the academic knowledge of the concept, there were still uncertainties. However, neither the students nor the teacher showed that they recognize this

subject-specific knowledge problem. Instead, both teacher and students seemed satisfied with the everyday explanation and did not develop the text analysis further at this point.

This example shows a rather advanced task where the students not only needed to find out how to explain what *satire* is in literary terms, but they also needed to understand a rather complex short story to apply the concept. At the bottom of the worksheet, there were concise explanations of the concept available for the students to use when applying the concept. Bea attempted to use it in their analysis (Excerpt 4, line 22), but it did not seem to help them. Thus, the same kind of ready-made, verbal explanation that was workable and easy to find in the first example of *farce* did not provide enough support for the task of applying and using the concept of *satire* as a literary genre.

6. DISCUSSION AND CONCLUSIONS

In this article, we analyzed the role of digital devices in classroom learning trajectories about literary concepts. Both tasks in our examples are primarily about literary concepts, but the processes of seeking information online are clearly present in these activities as well. Moreover, the students are well equipped with digital devices, and they are used to being constantly connected during lessons. Our analysis demonstrated the emerging activities as students turn to different digital resources when they encounter problems to explain and apply literary concepts and how the students' epistemic stances change through this process. In our examples, the students work with the concepts of farce and satire, which can be defined as academic genre concepts. When interpreting these findings, we must bear in mind that we have selected moments of students working with L1 concepts, but this might not be the first or last time that these students deal with these topics. Thus, our analysis highlights the learning trajectories and activities during these selected moments where digital resources are used without saying that this is all they learn or know about the concepts in question.

When studying literary concepts, students face the challenge to develop their understanding from everyday thinking to conceptual thinking of terms and concepts (e.g., Corrigan, 2019; Johansson 2019; Torell et al. 2002). Furthermore, previous research showed that although students are able to give at least partial explanations for the required concepts, they tend to avoid them when doing literature analysis (Johansson, 2019). In line with these studies, we have shown that students have an everyday understanding of the concepts with which they are dealing. Our first example shows how the everyday understanding of a concept serves as a starting point for the task but does not provide a straightforward route to a more specific information search. In our second example, the students' initial understanding of the concept seems to be challenged in relation to the sources they find. However, we have shown that the students do not seem to problematize this challenge so that it

would transform their initial understanding in relation to the academic meaning of the concepts, which is about different genres in this case.

Unlike Johansson's (2019) findings, the students in our examples were able to search for information online. In our analyses, we noticed that the students used information seeking practices that have been well demonstrated in prior research (Blikstad-Balas, 2016; Head & Eisenberg, 2010): they use one-word search strings to get to Wikipedia. This kind of gathering information seemed to match the task, which required explanations for the concepts, but did not help the students when they were supposed to apply the concept in their analysis. This in turn highlights the differences between the activities of explaining and applying the concepts. As our second example shows, in their interaction, the students did recycle the concise definition that they had found on the Internet, but the definition did not contribute to the required text analysis in the task. Hence, our examples point to difficulties for students to use sources from the Internet as resources in learning trajectories directed to applying concepts beyond short explanations.

Compared to traditional worksheets on paper, the students' findings on their screens consist of semiotically more varied layouts entailing verbal texts in combination with images, colors, and sometimes sounds. In our second example, it is not the printed text but the image of the TV celebrity that seemed to puzzle the student. However, even if an unexpected search result could be understood as a challenge and a starting point for a deeper reflection, this did not seem to be the case during the students' digital search activities in our examples. One explanation for this could be that the images or unexpected content that they found did not fit well with the task construction that largely called for verbal answers based on verbal texts. Hence, our findings in this study point at a phenomenon that could be described as a semiotic mismatch, where multimodal information that students find online in the form of images or video-clips seems challenging for them to transform into verbalized answers when solving an assignment.

A recurring dilemma concerns how teachers could take advantage of the learning potential that we see in these digital searches and elaborate on it in classroom discourse. It is not a new observation that school tasks often do not encourage students' in-depth analysis but are rather directed to pragmatically "fill in" good-enough answers (see, for example, Tanner, 2017); nevertheless, it is especially important to discuss this in relation to the digitalization of classrooms and the online resources that they provide. We know that digitalization often increases the tendencies of individualization in classrooms (Asplund et al., 2018; Selwyn, 2016) and that challenges the shared classroom discourse where the teacher can help students to connect new knowledge to their previous understandings as they generalize, explain, or discuss new information. Our findings highlight again the importance, from a learning point of view, of bringing in different perspectives from what the students pick up during individual or group work to the official classroom dialogue to collaborate and deepen understandings in relation to subject-specific content.

This brings us to the role of the given task and the activities it affords and requires. Kiili et al. (2012) suggested that tasks that require comparing sources and constructing an argument seem to encourage students to elaborate on the information they read online and eventually produce better essays. In our examples, both tasks—as represented in the task sheets or in the teachers' instruction—required, or at least suggested, elaboration on the information and application of the concept in analysis or shared discussion with peers. Although these affordances were available in the task design to deepen the understanding of the concepts in the tasks, they were not fully realized in the students' work in the moments that we analyzed. Considering our findings, it is possible to think that the persistent literacy traditions and the given time constraints of the day-to-day work in classrooms guide the students to complete the task effectively and pragmatically. This, in turn, may entail using Wikipedia as the only source and possibly minimizing students' input in elaborating on the information. While allowing a pragmatic way to accomplish the task in a given schedule, these practices may not be helpful when the information are applied. On the other hand, digital resources provide a mean to localize and gather information for candidate answers and filling in the papers, but as previous research pointed out, to understand and apply the concepts, joint discussion or face-to-face classroom discussion might be needed (see Doecke & van de Ven, 2012; Many, 2002; Wolfe, 2004). Finally, we can conclude that the teachers' challenge is to identify complex subject-related problems where detailed scaffolding and focus on the disciplinary understanding of the concept is needed.

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