“It is not always very cooperative”
Distributed agency in the use of spell check software in a lower secondary classroom

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Abstract
This study focuses on the distribution of agency in software-based spell checking in L1 (Language and Literature) teaching. Drawing on video-ethnographic data from a Swedish-medium school in Finland, the research shows that built-in spell checkers can both afford and constrain students' digital writing. Through examining the micro-dynamics between human and material agency in use of spell checking, the analysis illustrates that the software does not always work as expected from the user’s perspective, and hence becomes framed as a ‘trouble source’, assigned ‘linguistic authority’, and held accountable for not meeting human intentionality. We argue that technology’s inherent functions and properties play a central role in the co-constitution of agency in digital writing practices, and call for a greater awareness of generic spell checkers’ opportunities and limitations in teaching and learning.

Keywords
Affordance, agency, digital writing, spell checking

Introduction
Modern word processors have changed the ways in which humans manage written text, which has also become apparent in contemporary schools and classrooms (Erixon, 2018; Mangen, 2018). This article focuses specifically on the function and role of spell check software in students' digital writing in a lower secondary L1 (Language and Literature) classroom. As lower secondary students are undoubtedly in the process of learning to use digital writing tools, it is meaningful to examine more closely, and from different perspectives, how these tools are treated in classroom teaching practices.
The built-in spell checker is probably one of the most common text editing tools featured in today’s word processors. It has transformed and considerably increased the efficiency of spelling error detection and correction (Bestgen & Granger, 2011), constituting a ‘proofing tool’ that users frequently rely upon (Pan et al., 2021). Generic spell checkers – those designed for native (L1) writers, such as the spell checkers built into Microsoft Word and Google Docs – have become increasingly sophisticated, and are now widely distributed and used across different school subjects. Spell checking is one of the most common reasons students perform textual changes when writing digitally (Engblom et al., 2020).

Word processing programs, and their different inherent properties, are material artifacts that have found their way into classrooms. One way of describing material artifacts is by examining what they enable humans to do. This is connected to the relational concept of ‘affordances’ (Gibson, 1979; Hutchby, 2001), relevant to this study, which implies that digital writing tools provide various opportunities for human action, that is, they possess some ‘potential use’. When the spell check function is turned on, the software automatically detects and displays various spelling errors and, accordingly, provides immediate feedback in the form of corrections and alternative spelling suggestions. However, generic spell checkers are not ‘fool proof’, and their use may result in different types of errors, both human initiated and computer initiated (Bestgen & Granger, 2011; Musk, 2016, 2021). This suggests that the use of spell check software can also sometimes constrain students’ writing. In other words, when a spell checker is used, the software actively ‘performs’ a number of tasks, which is beyond complete human control, or agency.

The present study draws on a co-constitutive account of agency, in which classrooms are seen as sites for human and material agency. It proposes the idea that spell check software could be viewed as an active part of the writing process with which the human writer must interact, and that agency could be seen as a distributed capacity between the software and the human user. To understand what this means for writing practices, there is a need to closely investigate these co-actions between humans and technology. We believe it is justified, and find it timely, to recognise the materiality of technology, as it has not received much attention in previous empirical classroom research concerning students’ use of spell checking. Our aim is to gain a deeper understanding of the function of spell check software in students’ digital writing by exploring the distribution of agency when students encounter the generic spell checker in Google Docs. We examine the micro-dynamics between human and material agency in the use of spell checking in the context of a Swedish-medium L1 classroom (grade 7–8) in Finland. Two instances, in which the laptop keyboard comprises the writing tool and the laptop screen displays the students’ writing, are analysed. The following research questions guide the study:

1. How is agency distributed when students engage in software-based spell checking?
2. What is the function of spell check software in students’ digital writing?

Previous research into software-based spell checking in educational contexts

To date, a vast body of literature has been concerned with students’ digital writing activities and the significance and function of writing technology in teaching (see Kucirkova et al., 2019; Williams & Beam, 2019 for reviews). Among Swedish lower secondary students, Dahlström (2019) found that word processing software offered a range of action possibilities enabling learner agency. In this study, we infer that ‘write-ability’ (knowing how to
write correctly) and ‘edit-ability’ (the possibility to erase and rewrite) (Dahlström, 2019) are the most prominent affordances in software-based spell checking. Using spell check software can also be seen as a part of ‘augmented writing’ (Taipale, 2014) that allows writers to use automatised text editing tools, making writing faster and increasingly computer initiated.

In examining the quality of spelling errors, research points that there are seemingly varying correction rates between different spell checkers (e.g., commercial and non-commercial). Generic spell checkers are better adapted to detect and correct single letter mistyping than lexical misspellings, due to greater target deviation in the latter (Bestgen & Granger, 2011). Generic spell checkers are further limited and less adapted to meet the needs of non-native writers, as shown for instance among German (Rimrott & Heift, 2008) and Arabic-speaking (Saigh & Schmitt, 2012) L2 (second language) students. There are examples of targeted L2 spell checkers that have been developed in different languages (e.g., Lawley, 2016), while Lin and colleagues (2017) show that spell check software can also enhance L2 students’ incidental learning of spelling skills. In addition, it is shown that word processing software and in-built spell checkers can support students with learning disabilities (MacArthur, 2009).

In terms of the spelling correction process itself, some empirical studies have examined the strategies followed by students when encountering different spell check signs. In a Canadian context, Figueredo (2006) concluded that primary school students used different methods to correct spelling errors and often succeeded in spelling correctly with the help of the spell checker. Engblom and colleagues (2020) studied Swedish primary school students performing text revisions in digital writing and found that the most common cause of textual changes was spell check underlining. The students performed different strategies to eliminate the spell check signs, for example, testing different letters and letter combinations, changing and replacing a word with a synonym or related word, or erasing the word. However, students rarely used the spell checker’s right-click function, which indicates a greater need to explore the affordances of spell checking.

Furthermore, Cekaite (2009) found among Swedish upper secondary L2 students that software-based spell checking may increase creative collaborative engagement and serve as an ‘under-specified diagnostic tool’, where students rely on their own skills more than on the software’s distinctive features. In addition, Musk (2016, 2021) studied Swedish upper secondary L2 students’ repair practices in collaborative digital writing, and identified different trajectories in the spelling correction process, noting that ‘self-initiation’ and ‘self-correction’ seemed to be the most preferred. Central to Musk’s (2016, 2021) research is that the spell checker is treated as an ‘additional agent’ when two students work together with joint visual access to the computer screen. The spell checker itself is often positioned as ‘knowing’ better and has the potential to act as a scaffold for students’ learning, which Brown and Allmond (2021) also note in their study among first-grade emergent bilingual students when using word prediction software.

Taken together, in existing classroom research into software-based spell checking, less attention has been given to the materiality and agency of technological artifacts. Previous studies have mainly focused on the interactional and sequential patterns or strategies taken by individuals, foregrounding human discourse in spelling correction. It is also worth noting that many studies were conducted over ten years ago – much has happened since then – and among L2 students. As pointed out by Kucirkova and colleagues (2019), there is a need of more thorough analysis of students’ on-screen activities and co-actions with the technology itself. Responding to this, the present study explores in further depth the use of spell
checking as an activity where agency is distributed between, and co-constituted by, human and material entities, in order to gain a more nuanced understanding of the conditions and significance of technology usage in the context of L1.

**Theoretical standpoints**

A central claim in sociomaterial theorising is that agency is distributed between, and co-constituted by, human and nonhuman entities (Burnett & Merchant, 2020; Sørensen, 2009). The material features of word processing software (e.g., formatting, spelling and grammar check, design tools) are available to all students at a given time, but what the word processor then ‘does’, referring to its performativity and agency, depends on how students become engaged with its ‘materiality’.

When speaking about the materiality of technology, we refer to what technology ‘is’, that is, its constituent parts being available to all users at a given time (Leonardi, 2012). As Leonardi (2010) argues, intangible artifacts, such as digital technologies, become material when they have practical significance for their users. When something becomes material, that is, when matter starts to ‘matter’, it means that it has agency. Our intent is not to anthropomorphize material artifacts (not least to avoid technological determinism), nor to draw on human supremacy for that matter, but rather to consider the human and the material enacting each other. Digital writing, then, is not determined solely by the internal goals and intentions of students and teachers, nor the materiality of technology, but rather by the entanglement of these in the classroom. The distribution of agency is understood and examined from within the internal relatedness of human and nonhuman entities, a notion that is strongly supported by new material considerations of agency (Barad, 2007). Based on this, our analysis can contribute to the understanding of when or how spell checking might become an affordance or constraint in students’ writing.

Gibson (1979) first introduced the widely applied notion of affordance, to describe the relationship between animals and the environment. In a further development to the Gibsonian view, it is argued that an affordance is not predetermined or does not exist in the same way for everyone, but is something that humans need to recognise and perceive as meaningful and useful in relation to their goals (Hutchby, 2001). Hence, affordances hold a relational position in shaping social practice, or as Leonardi (2012, p. 38) states, ‘… affordances and constraints are constructed in the space between social and material agencies’. Hammond (2010) describes further that affordances are ‘complementary’, that is, they can provide both opportunities and limitations. Additionally, one artefact can provide several affordances and, thus, result in multiple outcomes.

In digital writing, affordances imply the potential use(s) of word processing software in students’ learning. In software-based spell checking, students encounter various signs such as red (orthographic) and blue (grammatical) underlining, and autocorrect features. However, it is often the case that spell checkers do not recognise the accuracy of names, abbreviations or foreign lexical items for a variety of reasons (e.g., the items are not contained in the dictionary; the spell checker is wrongly configured or not turned on). This might result in difficulties for both humans and spell checkers in detecting and correcting spelling errors properly. For instance, when underlining a correct lexical item in red, the spell checker performs an ‘overflag’, that is, a false positive, which has been shown to be rather common in digital writing (Bestgen & Granger, 2011; Musk, 2016). ‘Overflagging’, or ‘underflagging’ (a false negative, when a misspelling becomes unflagged), on the contrary, are phenomena that students nowadays are challenged to handle in one way or another when writing digitally.
When the software works in expected ways, the potential performance of technology remains invisible. On the contrary, in the case of a breakdown, accident or malfunction, the agency of technology can change and become more visible and performative in nature, that is, its ‘agency pattern’ changes (Erofeeva 2019, p. 596). In the case of word processing software not working as expected from the user’s perspective, it takes on a more performative role, which may prompt the user to engage in finding ways to achieve their goal(s). We further relate this argumentation to Pickering’s (1993) early conceptualisation of agency as a ‘dialectic play of resistance and accommodation’. Pickering (1993, p. 569) refers to resistance as ‘the occurrence of a block on the path to some goal’, in the sense of a practical obstacle within a goal-oriented practice. Accommodation, in turn, forms a response to resistance by finding approaches to achieve a particular goal in a given context.

Method
This research is part of a broader longitudinal study, Connected Classroom Nordic (CCN), that follows digitally-rich lower secondary classrooms in Denmark, Finland, Iceland and Sweden. CCN has collected data in three cycles during 2019-2022 in the school subjects L1, Mathematics, and History/Social Science, in one school per country.

For the present study, we use data from two video-recorded lessons generated during 2019-2020, in the school subject L1 in a Swedish-medium school in one of the larger cities of Finland. The first recording took place when the class had recently started lower secondary school (grade 7, students aged 12–13). Study participants were using shared school laptops and tablets; the devices were usually stored in the school office and collected from there if needed in teaching. The second lesson was recorded in autumn 2020, when the same class had entered grade 8 (students aged 13–14). At this stage, the school had changed its infrastructure to providing 1:1 access, that is, the students received their own school laptops that they brought with them to class and kept in their lockers and/or carried home between school days.

All participants were recruited based on voluntary participation. Informed consent was required from students, caregivers and teachers, and they received information about the research on-site at the school ahead of data collection in 2019. All students in four different classes were informed and asked for consent a) to be recorded, or b) to be recorded and be a focus student. In total, 17 students expressed their interest in being a focus student, and we chose 2–4 students per class, from three classes altogether. In this process, we aimed to achieve gender balance and linguistic diversity. All names used in this study are pseudonyms.

Fieldwork was conducted with video-ethnographic methods, which have proven to be effective for studying the complexity of social and material practices (Heath et al., 2010). The use of multiple video cameras allows for close investigation of classroom activities in real time when digital technologies are used. Recording was carried out by 1-3 researchers with a three-camera solution: one placed at the back of the class, following the teacher’s actions and whole class teaching, others following the focus students (one camera per student), framing the action in order to have a special focus on screen activities when digital technology was being used. In 2019, we had two focus students in L1, and in 2020, due to Covid-19 restrictions, we limited ourselves to one focus student. Both the focus students and the teacher were equipped with their own microphones for audio recording. Afterwards, the video files were synchronised into a mixed three-camera configuration (Figure 1).
The material was then computed using NVivo software. A comprehensive review was carried out of the video-recorded lessons (n=23; 1541 minutes’ recording in total). Our unit of analysis was the encounters of the focus student(s), the teacher and technology within the classroom space. Moments and traces in which technology was topicalised or recognised by the student(s) and/or the teacher were identified and compiled into a list of sequences. We documented information about the hardware and software used, as well as descriptions of contextual features: types of activity, entities involved, who was doing/saying what. Digital writing proved to be a frequently-occurring practice, and the use of spell checking became actualised and topicalised several times. This led us to place analytical emphasis on the human-technology interaction in the student-spell checker entanglement (Figure 2).

Figure 1 Mixed three-camera angle with two focus students.

Figure 2 A typical spell check underlining and dialog box when using the right-click function in Google Docs.
For this analysis, we selected two instances where focus students Alexandra and Daniel encountered the generic spell checker within Google Docs. Both instances were transcribed verbatim. In the transcripts, lines are included for each participant, namely, the focus students, the teacher, and the spell checker. In each line showing a human move, we have also included symbols to indicate different modalities, for example, a computer icon indicating any human activity on the screen, and a speech bubble icon to mark lines of talk. The moves made by the spell checker are placed on their own lines and feature a red squiggly line under words that become flagged. Double brackets are used to describe contextual features. Everything spoken aloud or typed has been translated from Swedish to English, with the English translation marked in bold and placed underneath the expression in the original language.

Findings
The two empirical examples illustrate how students become entangled with the spell checker in Google Docs. Both examples are divided into different parts that will be elaborated on separately. The examples are presented so that the degree of complexity in the spelling correction process increases; as will be seen, the function of spell check software can vary from constituting a clear affordance to forming a constraint that becomes framed as a trouble source.

Example 1
The first example selected is from the lesson recorded in 2020 (grade 8). The class listens to a podcast around which the teacher has prepared some questions. The teacher instructs the students to copy the questions from Google Classroom and answer them individually in Google Docs while listening to the podcast, using their own school laptops. While the focus student Alexandra answers one final question, the spell checker becomes active twice as she writes a sentence in which she types the lexical items *frågor* (questions), analysed in 1.1, and *författargäster* (‘author guests’, that means authors invited to the podcast), analysed in 1.2. In both parts, Alexandra encounters the spell checker independently, without asking the teacher or a peer for help.

1.1 Utilising the affordances of write-ability and edit-ability

![Figure 3 Excerpt 1.1, lines 1-7.](image-url)
In line 1, Alexandra begins typing a sentence in which the latter vowel in the lexical item *frå-går* (questions) becomes misspelled. The spell checker detects this and accordingly underlines the word in red (line 2). Alexandra first continues typing the sentence (line 3), after which she reacts to the underlining by the spell checker. In response to the spell check sign, Alexandra uses the right-click function to open a dialog box (line 4). The spell checker, in turn, provides an appropriate suggestion, *frågor* (questions), as a spelling correction, and thus affords Alexandra the possibility to edit the text and to write correctly. Alexandra accepts the input from the software (lines 5-6), and consequently, the spell checker replaces the misspelled word and removes the underlining. In this way, Alexandra's correction outcome is successful, as seen in line 7.

In this first example, the activity proceeds in a routine, trouble-free manner, and agency moves in-between the participants smoothly. Agency is distributed, as the spell checker helps Alexandra notice a conventional misspelling, and then provides a correct spelling suggestion. As seen in line 3, Alexandra continues typing immediately after the misspelling occurs, indicating that she would not have noticed the spelling error if the spell checker had not detected it and flagged the word. Usually a word completer (such as pressing the spacebar or inserting a full stop) is needed after the misspelled part, causing a small temporal delay between the mistyping and the appearance of the spell checker’s red underlining. This might force the typist to go on writing before the spell check sign becomes visible. However, the occurrence of red underlining is more of a general visual input from the software, as it does not yet specify which part of the word is misspelled or how it should be remedied (Cekaite, 2009), and the decision to take any subsequent action remains with the typist. Thus, the spell checker makes the initial misspelling visible to Alexandra through the red underlining, and then provides a spelling suggestion once Alexandra has reacted to the flagging, by right-clicking on the lexical item in question. Eventually, the process also involves an active choice by Alexandra: whether to align with the software or not, relying on her own linguistic awareness and digital skills at that moment. Accordingly, both material and human agency become significant, and the affordances of ‘write-ability’ and ‘edit-ability’ are constructed between the social and the material: in the student-spell checker entanglement.

From a material agency perspective, it can further be understood that the software possesses ‘an agency of a silent object with a constitutive role’ (Erofeeva, 2019, p. 597). The spell checker comprises a somewhat routine technology that participates in the co-constitution of agency, working as expected and remaining ‘silent’ in that sense, in the role of a constitutive object contributing clarification rather than causing trouble. The function of the software, in this case, is that it affords Alexandra to write correctly and to perform a textual change; in this way, the spell checker takes on more of a ‘facilitative’ role in the writing process.

In the following, 1.2, Alexandra continues typing the same sentence and encounters the spell checker again, but this time the activity proceeds differently.
1.2 Encountering an overflag, but not accepting it at face value

Excerpt 1.2

08 ALEXANDRA □ types frågat av alla författarjäsen
has asked all authorquen

09 □ deletes jäsen and then types gast
quen gast

10 □ deletes gst and then types gäster.
gst guests.

11 SPELL CHECKER flags författargäster
authorguests

12 ALEXANDRA □ right-clicks on författargäster and a dialog box
opens authorguests

13 SPELL CHECKER suggests författar gäster
author guests

14 ALEXANDRA □ closes the dialog box

Figure 4 Excerpt 1.2, lines 8-14.

In the second part, Alexandra initially mistypes some letters in the lexical item författargäster (author guests), retypes them and spells the word correctly (lines 8–10). The spell checker, in turn, flags the word in red (line 11). As in the previous encounter, excerpt 1.1, Alexandra reacts by right-clicking on the underlining (line 12), and the spell checker suggests a word segmentation, namely författargäster (author guests) (line 13). In this instance, the software fails to recognise the lexical item författargäster as a compound in Swedish, hence the spell checker amounts to resistance (Pickering, 1993) and provides an alternative spelling suggestion instead. In this way, a software-generated detection error occurs, as the spell checker performs an overflag, that is, a false positive, when underlining a correct lexical item in red. This time, though, Alexandra does not align with the software, but ignores the spelling suggestion by closing the dialog box and leaving the word flagged (line 14).

In this example, Alexandra chooses not to take the spell checker’s suggestion at face value, trusting her own linguistic knowledge rather than the software. It indicates that Alexandra is aware of the spell checker’s unreliability in this case. The agency of the spell checker is enacted when it flags a certain lexical item and provides Alexandra the opportunity to edit the text. However, overflagging changes the perception of the spell checker from an affordance to constituting more of a constraint on write-ability. Rather than detecting a real misspelling, the software flags a correctly written word; this may, ultimately, leave the typist with some uncertainty as to whether the underlined word is correctly spelled or not. This causes a tension between the participants, since the spell checker indicates that the lexical item is misspelled (although not yet specifying which part should be remedied) and the typist must decide in that moment whether to trust their own linguistic and/or digital skills or the capabilities of the spell checker. Still, as seen in this example, it is something that can be overridden; Alexandra accommodates it by leaving the word overflagged, although she does not attempt any other strategy or remove the underlining.

The next example demonstrates how the spell checker is questioned and becomes framed as a trouble source in a student-teacher discussion.
Example 2
In the second example, from the lesson recorded in 2019 (grade 7), students are individually writing a narrative text relating to their childhood using Google Docs on the school laptops. The focus student Daniel sits on his own, working quietly and occasionally asking the teacher, Petra, for help. Daniel faces a spelling challenge when he types the lexical item bilböcker (car books, which means books about cars) and the spell checker becomes active. This instance illustrates how agency is distributed between student, spell check software and teacher. The example is divided into three parts: 2.1 shows how Daniel encounters the spell checker while attempting to solve the spelling challenge independently; this is followed by 2.2 and 2.3, which show how the activity progresses to seeking help, and Petra gets involved.

2.1 Negotiating a software-generated spelling error

Excerpt 2.1

01 DANIEL ▶ types Jag älskade
   I loved

02 ▶ deletes ed and then types ade också böcker, bl
dveved also books, ca

03 ▶ deletes bi and then types bilböcker, carbooks.
   ca

04 SPELL CHECKER flags bilböcker, carbooks

05 DANIEL ▶ right-clicks on bilböcker and a dialog box opens
   carbooks

06 SPELL CHECKER suggests ljudböcker, audiobooks

07 DANIEL ▶ closes the dialog box and then types a space
   between bil and böcker
carbooks

08 SPELL CHECKER flags bil, car

09 DANIEL ▶ right-clicks on bil and a dialog box opens
   car

10 SPELL CHECKER (suggests bok)
car

11 DANIEL ◐ bil ((silent self-voicing))
car

12 ▶ steers the cursor at bil and böcker, carbooks

Figure 5 Excerpt 2.1, lines 1-12.
In the initial stage, a negotiation commences between Daniel and the software, as both try to solve the software-generated spelling error using different strategies. Firstly, Daniel mis-types the last three letters in the lexical item älskade (loved) and then retypes them correctly (lines 1–2), without assistance from the software or any other human involved. Daniel then continues, typing the word bilböcker (car books, line 3) and, as seen in line 4, the spell checker amounts to resistance, indicating that the lexical item is misspelled. To accommodate, Daniel right-clicks on the underlining (line 5) and the spell checker suggests ljudböcker (audiobooks) as an alternative word suggestion (line 6). This implies that bilböcker is not contained in the software’s dictionary, thus the spell checker cannot recognise the word and performs an overflag. Ljudböcker is a proper compound, but in this case an inappropriate replacement word as it still deviates markedly from the target word. This points to the unpredictability and limiting aspects of the software, as the suggestion(s) offered by the program can differ noticeably from the typist’s intention(s), and exclude all other possible replacement words.

Daniel does not accept the software’s suggestion, but proceeds with a word segmentation (line 7). It can be understood that he is still trying to find a solution, to locate the spelling error, taking another line of accommodation, but the spell checker resists again by flagging bil instead (line 8), which still does not correspond to his intentions. As in the previous attempt, Daniel uses the right-click function (line 9), and this time the spell checker suggests the word bok (book, line 10). This again demonstrates the unpredictability of the software, as it overflags a common word and thus provides confusing feedback, which may increase the typist’s linguistic uncertainty. Then, in line 11, Daniel pauses with a silent self-voicing of the lexical item bil as it evidently catches his attention. In this way, Daniel seems to become deeply engaged with the software’s materiality, enacting its agency, and what the software ‘does’ is beyond Daniel’s direct or complete control and agency.

In the following, 2.2, the activity progresses to seeking help, and the teacher gets involved.
2.2 Defining the trouble source and assigning the spell checker linguistic authority

Excerpt 2.2

13 DANIEL att den hâ e jättkeonst, den niink- nå ja ha bil like this is very strange, it like when I have car
14 right-clicks on bil and a dialog box opens bil
car
15 SPELL CHECKER (suggests bok) book
16 DANIEL så de bli blo- b- bok it becomes blo- b- book
17 closes the dialog box
18 å sen nå ja sätt de ihop and when I put it together
19 deletes r
20 åhâ nu s- oh now s-
21 types r
22 SPELL CHECKER flags bil car
23 PETRA aa
24 DANIEL sen nå ja sätt de ihop så de säge when I put it together it says
25 deletes a space between bil and böcker car books
26 SPELL CHECKER flags bilböcker carbooks
27 PETRA já i s- yes in c-
((points on the screen towards bilböcker))
28 DANIEL oo ljudbok ee audiobook
29 right-clicks on bilböcker and a dialog box opens carbooks
((points on the screen towards the dialog box))
30 SPELL CHECKER (suggests ljudböcker) audiobooks

Figure 6 Excerpt 2.2, lines 13-30.
With the utterance ‘like this is very strange’ (line 13), Daniel begins the discussion by framing the software as problematic and acting strangely. It indicates that Daniel is confused by the spell checker’s countermoves. Daniel emphasises the lexical item *bil*, supported by the preceding turn (excerpt 2.1, line 11), implying that he has defined the ‘trouble source’ (Musk, 2016) before turning to Petra. Daniel then demonstrates the whole occurrence by repeating the steps on the computer, with the software performing the same countermoves as earlier, in order to point out the final trouble source, that is, the spell checker’s alternative spelling suggestion *ljudböcker* instead of accepting *bilböcker* as such (lines 14–30). Both Daniel and Petra are oriented towards the material artefact through their bodily movements and positioning. In line 27, Petra intervenes and starts pointing at the lexical item on the screen, as a bodily gesture of her trying to re-direct Daniel’s attention towards the correct solution, indicating that Petra realises the spell check function is limited. Meanwhile, Daniel continues and points in a different direction, towards the dialog box (line 29).

In this second part, the spell checker becomes framed as a trouble source – and questionable – due to its inability to recognise or accept a specific lexical item. The spell checker becomes agentic in initiating the dialogue between Daniel and Petra, as it is something in the software itself that evoked Daniel’s uncertainty in the first place. In demonstrating the occurrence to Petra, it can be understood that Daniel claims to know how to proceed when encountering the red underlining, but at the same time, he relates to the input from the technological artefact as something to be taken seriously. Daniel points out that something has gone wrong, and the spell checker is given its own voice in the line of actions, which needs to be accounted for. When the software does not work as expected, Daniel’s awareness increases and he ascribes agency to the spell checker. According to Daniel, the software ‘says’ something (line 24) and he cannot simply override it, but rather turns to Petra to check his understanding with her. In this way, the software becomes framed as an autonomous, intelligent entity, as a source of ‘linguistic authority’ (Cekaite 2009, p. 328) in its own right, and Daniel’s linguistic knowledge and agency are at issue here. When Daniel turns to Petra, then, it can be understood that he is trying to find an explanation for the spell checker’s agentic ‘behaviour’.

In the final part, 2.3, Petra intervenes and continues by providing an explanation for the occurrence.

### 2.3 Holding the spell checker accountable for not meeting human intentionality

**Excerpt 2.3**

<table>
<thead>
<tr>
<th>Line</th>
<th>Speaker</th>
<th>Utterance</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>PETRA</td>
<td>nå u- de va bra att du fråga no u- it was good that you asked</td>
</tr>
<tr>
<td>32</td>
<td>DANIEL</td>
<td>closes the dialog box</td>
</tr>
<tr>
<td>33</td>
<td>PETRA</td>
<td>de- i sammansatta ord så e den int allti helt it- in compound words it is not always very</td>
</tr>
<tr>
<td>34</td>
<td>DANIEL</td>
<td>okej okay</td>
</tr>
<tr>
<td>35</td>
<td>PETRA</td>
<td>samarbetsvilli, men du kan, så där ska du skriva cooperative, but you can, you should write like that</td>
</tr>
<tr>
<td>36</td>
<td>DANIEL</td>
<td>(jå) (yes)</td>
</tr>
</tbody>
</table>

**Figure 7** Excerpt 2.3, lines 31-36.
In line 31, Petra acknowledges Daniel’s help-seeking and continues by explaining that the spell checker does not always work as expected in compounds (lines 33, 35). Petra’s utterance ‘in compound words it is not always very cooperative’, provides an account for the unexpected response from the software that Daniel encountered. When referring to the software’s ability to cooperate, it can be understood that Petra is holding the spell checker accountable for not meeting Daniel’s intentions, as a way of avoiding placing any blame on Daniel and mitigating the problem. In this discourse, responsibility for the way in which spell checking functions is attributed to the materiality of the software, that is, the spell checker itself, invoking the agency of technology. In the end, the correction outcome is that Daniel types the word *bilböcker* as he had it in the very beginning, after being instructed by Petra to do so.

In this example, the spell checker has a limiting and disrupting function in Daniel’s writing process, instead of affording him to know how to write correctly. This causes Daniel to turn his attention towards the teacher, thus the spell checker becomes an enacting force in the encounter between human and nonhuman. By disrupting Daniel’s writing process, the spell checker takes on a more performative role, that is, the agency of the software becomes more visible (Erofeeva, 2019), which has a significant impact on how the activity proceeds. As seen, Daniel takes the opportunity to edit the text when he tries to locate the spelling error and remedy the underlining, but does not come up with a satisfying solution on his own. The input from the spell checker is confusing, rather than providing clarification or an appropriate solution. After the teacher’s intervention, it becomes clear to Daniel that no textual change is needed and he may therefore disregard the spell check sign.

**Discussion**

This article has examined the micro-dynamics between human and material agency in spell checking, to gain a deeper understanding of the function and role of spell check software in students’ digital writing. Findings suggest that software-based spell checking can result in comparatively different outcomes. On the one hand, spell checking could constitute a practice carried out in a routine manner, almost invisibly, which highlights the action possibilities of word processing software. On the other hand, the software could also give rise to confusion and uncertainty, initiating discussion between student and teacher, rather than providing clarification or solutions.

One common outcome is that when students face spell check underlining, it is something they act upon almost immediately and try to get rid of in one way or another (Cekaite, 2009; Engblom et al., 2020; Musk, 2016, 2021). This was also visible in our two examples, as the students did not rely solely on their own linguistic or digital skills, but rather turned to the software’s distinctive features by using the right-click function. Whereas previous research indicates that younger students are less likely to use the right-click function (Engblom et al., 2020), this study proves a certain digital awareness among these lower secondary students. The spell checker did not become fully overlooked, although the students did not remove the red underlining or make use of the ‘add to dictionary’ function either. Thus, word processing software provides various affordances that often go unexplored. However, as Taipale (2014) found in a Finnish study, older students are even more critical towards software-generated automatic corrections and spell checking, which further indicates that the degree of reliance on writing technology varies between students of different ages.

When viewed through the lens of distributed agency, in this study, the students’ reactions and solutions to correct spelling are phenomena that emerged in situ, through the entanglement of the participants. Overflagging could be observed as a resistance (Pickering, 1993)
from the spell checker, as an obstacle in the path when students were typing. Despite the benefits and scaffolding function spell check software may possess (Brown & Allmond, 2021; Lin et al., 2017; MacArthur, 2009; Musk, 2016, 2021), generic spell checkers can also provide confusing feedback and cause uncertainty. Although the spell checker itself does not possess intentionality as humans do, but rather functions through its material and performative qualities, the software nonetheless plays a powerful role in shaping the course of action, and thus the ongoing digital writing process.

Generally, overflagging can be seen as a malfunction of the software, as it does not function optimally, highlighting the limitations of spell checkers rather than their affordances. Another scenario could be the occurrence of an underflag, a false negative (Bestgen & Granger, 2011), highlighting further that software-based spell checking is not always predictable or reliable. Thus, in the long run, events such as those presented here can become important encounters for both students and teachers to learn from, in order to understand and cooperate with technology in more advanced and creative ways, increasing awareness and critical thinking around technology. For instance, Daniel’s case could be seen as an opportunity to learn that overflagging can be overridden. Both Daniel and Petra problematised the function and role of the spell checker, but the situation did not develop in a didactic direction. With lack of further instruction, spell checking (as only one text editing tool among others) is driven by the performativity of the software, and the practice of digital writing is at risk of taking shape under the conditions of the technology itself to an increasing degree. In addition, differences in students’ linguistic knowledge may lead to different outcomes in the student-spell checker entanglements, hence there is a potential need for micro-level studies that focus on spell checking in relation to students’ diverse linguistic backgrounds.

Overall, some methodological questions need to be considered when investigating complex sociomaterial practices. The video-ethnographic design using multiple cameras allowed for a close analysis of the writing activities, including the students’ bodies, talk and on-screen activity. This made it possible to follow in detail the co-actions between humans and technology in the focused writing activities. Nevertheless, technology is developing rapidly, and ongoingly (re)shaping the sociotechnical world students live in, hence our video data should be considered in relation to the point of time at which it was produced. Already as we conclude this article, new AI-powered language models, such as ChatGPT, are expected to take a stronger foothold in education, affecting future digital writing practices (Robinson, 2023). This raises new onto-epistemological questions, not least concerning the notion of agency, but also many ethical considerations for future research.

In conclusion, we argue that the inherent functions and properties of technology, such as built-in spell checkers, play a central role in the co-constitution of agency in situated classroom practice, not least in digital writing activities. Although word processors function accurately and predictably in many cases, software programs do not always respond to the user’s intentions, for instance when they are not fully developed in relation to lexicon, hence the software may possess a disrupting and constraining significance in students’ writing.

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References


