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Developing student-teachers' interactional competence through video-enhanced reflection: a discursive timeline analysis of negative evaluation in classroom interaction

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ABSTRACT

This article presents a case study of a student-teacher's change in classroom interactional practices as she engages in video-enhanced reflections and collaborative feedback encounters during her practicum in Sweden. We specifically focus on an interactional practice that can be observed in many classrooms: teachers' use of (overt) negative evaluation (i.e. 'No!') that immediately follows learners' incorrect answers. Using discursive timeline analysis (DTA), which is a combination of Conversation Analysis and Interactional Ethnography, we track the use of the focal interactional phenomenon across (1) video-recorded classroom interactions, (2) audio-recorded triadic post observation conferences, (3) student-teacher portfolios, and (4) interviews. We demonstrate that after getting video-based feedback with a video-tagging tool (i.e. VEO) and reflecting on her overuse of (overt) negative evaluation, the focal student-teacher avoids this interactional practice in her future teaching. As the analysis illustrates, this change of practice is possible thanks to data-led reflections and the evidence-based feedback that the student-teacher received. Our analysis therefore shows that reflection and feedback with a mobile video-tagging tool can facilitate increased awareness of classroom interactional practices. We argue that digitally enhanced, video-based reflections can promote teacher-learning in teacher education programmes and that using discursive timeline analysis can provide rich insights into these processes.

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1. Introduction

In teacher education, lesson observations are often followed by post-observation feedback sessions or post-observation conferences (POCs, Jons 2019), where aspects of classroom interaction can be noticed through dialogic reflections if classroom videos or video-annotation tools are used. Video enhanced observations and reflection during POCs, as recent research has shown (Bozbıyık, Sert, and Dilek Bacanak 2021; Gynne, Larsson, and Sert

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2022; Sert 2019; van Es et al. 2017), can help teachers become more aware of their own classroom interactional practices (i.e. Classroom Interactional Competence, Walsh 2011) and facilitate teacher development (e.g. Sert 2019; Sert and Jonsson forthcoming; Walsh 2011, 2013). Aspects of classroom interaction that teachers can notice and reflect on may include types of questions asked, responding to and evaluating student answers, echoing and reformulating student utterances, managing multilingual repertoires, and using gestures and other visual resources (e.g. Seedhouse 2008; Sert 2015; Walsh 2011). In order to observe these interactional phenomena, methodological tools that can depict minute level details of teaching should be deployed, so that aspects of teacher development in-situ and over time can be identified.

Recent research also shows that teacher education and reflective practice should be data-led and evidence-based (Mann and Walsh 2017). Traditionally, videos have been used for reflection and feedback purposes, but other digital tools (e.g. mobile video-tagging and annotation tools) have been increasingly integrated into teacher education programmes to visualise feedback and observation practices (Çelik, Baran, and Sert 2018; Hidson 2018; Sert 2021, 2023a). Through video-enhanced reflections on the classroom interactions that they notice while watching videos, teachers can 'develop new awareness about their instructional practices' (Ding, Glazewski, and Pawan 2022, 293).

Against this background, our study focuses on how student-teachers in pre-service teacher education in Sweden use a digital reflection tool together with a mentor and supervisor to focus on classroom interactional practices during a semester-long practicum period. The observation and reflection tool used (Video Enhanced Observation, Miller and Haines 2021) enables users to tag (i.e. annotate) classroom videos that can be reflected on immediately after lessons or retrospectively using a mobile device and a digital platform. In this study, we present a case of a pre-service English language teacher's change in classroom interactional practices as she engages in digitally enhanced reflections and collaborative feedback during her practicum in a Swedish upper secondary school. We focus on the teacher's use of (overt) negative evaluation (i.e. 'No!') that immediately follows learners' incorrect answers (see Seedhouse 1997, 2004), since this interactional practice (1) has been found to be a common practice in our dataset, and (2) has been selected for reflection and feedback by our participants themselves. We show how the focal participant first overuses this interactional practice but then avoids using it in future teaching after getting video-based feedback and reflecting on her overuse. Our focus on this phenomenon is also in line with the calls for an investigation into negative evaluation in teacher education contexts (Ingram, Baldry, and Pitt 2013; Seedhouse 2004).

Perhaps more importantly, in the study, we also suggest a novel analytical approach, Discursive Timeline Analysis (DTA), which is a bottom-up approach to analysing interactional development informed by conversation analysis (Sacks, Schegloff, and Jefferson 1974) and interactional ethnography (e.g. Castanheira et al. 2000). Using DTA, we identify and track the use of the focal interactional phenomenon across (1) video-recorded classroom interactions, (2) audio-recorded post observation conferences, (3) student-teacher portfolios, and (4) interviews. Given that 'little empirical evidence has been presented on how video use benefits actual classroom practice' (Gaudin and Chaliès 2015, 54), we aim to contribute to the development of data-led, video-based teacher education programmes that prioritise a focus on teachers' noticing of and reflections on classroom interactions. In line with Grossman (2014), we argue that in order to improve the quality of

instruction, researchers may need to reveal whether video-based teacher education 'is accompanied by *changes* in classroom teaching' (7). In order to find out whether such changes occur, the following research questions were posed:

How does a student-teacher use and avoid the use of (overt) negative evaluation in classroom interaction?

Is there evidence for change over time in the student-teacher's use of (overt) negative evaluation?

We identified and tracked the use and avoidance of negative evaluation in the dataset both through a conversation analytic investigation of classroom interactions and by locating participant orientations to this change in POCs and written reflections (see 3.4, Discursive Timeline Analysis). We do conceptualise this 'adaptation' (Jenks 2010, 148) in the responsive behaviour (i.e. use and avoidance of negative evaluation) of the student-teacher as change of classroom interaction practices and see it as part of teacher development and learning. Given that change 'involves transcendence of a particular time and space' (Seedhouse 2010, 248), we draw on data from more than one teaching event of a teacher, build collections of the interactional phenomenon, and trace how the phenomenon and its change is 'retrospectively' (Jakonen 2018) oriented to by the participants. This requires a longitudinal approach to track interactional phenomena in a timeline, which led us to implement Discursive Timeline Analysis, DTA. Our study thus aims to fill a research gap firstly by describing how a student-teacher changes her practices of using (overt) negative evaluation with the assistance of a mobile video-observation tool and data-led reflections, and secondly, by introducing the use of a novel methodological approach. To our knowledge, this is also the first micro-analytic and longitudinal investigation into the focal interactional phenomenon in a teacher education context (but see Skovholt 2018 for a non-developmental investigation). In this paper, in contrast to the other papers in this special issue, we also propose a method (i) for improving the quality of classroom interaction, and (ii) that allows teachers themselves, rather than researchers, to analyse their own interactions.[1]

2. Background and review of literature

Teacher development, in and beyond teacher education, partly involves trying out theoretical ideas and suggestions in practice 'over an extended period of time in a collaborative situation where the teachers are able to receive support and feedback, and where they are able to reflect critically' (Bell and Gilbert 1994, 494). It is a 'longitudinal process of teachers' behavioural change' (Evans 2002, 128) anchored in teaching practice and collegial discussions. Teacher development is a discursive process (L. Li 2019; Morton 2012; Sert 2019; Walsh 2013), which involves interacting with learners during teaching as well as reflecting on classroom interaction with peers/colleagues and experts (e.g. trainers, mentors, and supervisors) over extended periods of time. It is a process during which teaching expertise is co-constructed in and through talk-in-interaction and reflective writings (Bozbıyık, Sert, and Dilek Bacanak 2021; Sert 2015, 2019). Research has shown that the development of (student-)teachers can be enhanced through providing them with opportunities (e.g. through videos) for noticing their classroom interaction behaviours (Sherin and van Es 2005; van Es and Sherin 2002). This involves engaging in

reflections in, on, and for action (Schön 1987); raising awareness on one's own interactional practices in teaching, and transforming emerging instructional experiences into new teaching practices.

Based on these theoretical underpinnings, it can be argued that analysing teacher development over time should involve a systematic analysis of interactions in classrooms and other dialogic settings embedded in teacher education contexts. Furthermore, in order to facilitate the process of teacher development through reflections on classroom practices, a data-led (Mann and Walsh 2017; Walsh and Mann 2015) approach can be adopted, so that the participants can utilise audio-visual tools like videos for evidence-based reflections. In this section, we will first review studies that connect classroom interaction and teacher development, with a focus on those that resort to the use of audio-visual, technological tools. We will then zoom into one of these aspects of classroom interaction, highlighting a commonly observed phenomenon our case study draws on: responding to learners' answers using (overt) negative evaluation.

2.1. Video-based teacher education, teacher noticing, and classroom interaction

The use of videos and teachers' reflections on their own lesson videos have been a central concern in teacher education research for many years. In their comprehensive review of research on video viewing in teacher education and professional development, Gaudin and Chaliès (2015) argued that the practice of watching videos of one's own classroom interactions rests on the idea that it 'provokes the development of descriptive and critical reflection' (51). The process of watching one's own teaching practice may activate teachers' 'prior knowledge and experiences about teaching and learning' (Seidel et al. 2011, cited in Gaudin and Chaliès 2015), which may enrich their reflections. The use of videos in teacher education and development research has mainly centred around the construct of 'teacher noticing' (e.g. Sherin and van Es 2005; van Es and Sherin 2002; van Es et al. 2017; see König et al. 2022; Santagata et al. 2021), which we will briefly present here.

In their pioneering study, Sherin and van Es (2005) argued that videos can support teachers' ability to notice and reflect on classroom interactions and can be a powerful tool for helping teachers develop their observational skills and gain new insights into their own teaching practices. The authors proposed key components of teachers' ability to notice (see also van Es and Sherin 2002), including 'making connections between classroom interactions and broader principles of teaching and learning that they represent' (Sherin and van Es 2005, 479). The results also demonstrated that after learning to notice through classroom videos, teachers were able to formulate more evidence-based comments on their teaching practice.

In a recent systematic review of research on teacher noticing (König et al. 2022) it has been reported that the majority of the research that addresses video viewing and teacher noticing focus on mathematics education (63%) and science education (26%), while language education was the subject of investigation only in 6% of the studies. This is an important gap to address given that our case study involves a student-teacher who has been studying to be a teacher of Swedish and English. A recent development in the field of language teacher education is what Jackson and Cho (2018) have conceptualised as 'language teacher noticing', i.e. an 'awareness of features of second language classroom interaction that may influence student learning' (29). They used stimulated recall to elicit

responses from student-teachers of English as a second language at a US university. They found that teachers noticed aspects of teaching in particular during whole class interactions, and that their stimulated recall methodology is sensitive to time between teaching and recall (i.e. a short period of delay is associated with more noticing), a point that justifies the value of immediate post-observation conferences in teacher education.

This is in line with the work of a growing number of conversation analysts who argued that teachers' closer focus and reflections on micro details of video-recorded interactions is conducive to professional development (see Sert 2019, 2021; Waring and Creider 2021). Video-based reflections on classroom interactions have been proven to be effective for teacher development, especially when (student)-teachers are given the opportunity to engage in reflective cycles using video-recordings from their own lessons. In one such study, Carpenter (2023) investigated – longitudinally – how a student-teacher was able to improve the ways she elicited participation from her learners and argued that 'turn-by-turn analysis coupled with focused pedagogical feedback given by an experienced supervisor can shape the development of a student teacher' (15). The use of videos and transcriptions in professional training has been at the core of methods like CARM (Stokoe 2014), which has recently been found to be effective in teacher education contexts (Sikveland et al. 2023). Videos have commonly been used for reflection and feedback purposes, but other digital tools (e.g. mobile video-tagging and annotation tools) have also recently been integrated into teacher education programmes to visualise feedback and observation practices and help teachers notice aspects of classroom interactions that are conducive to good pedagogy (see, for example, Bozbıyık, Sert, and Dilek Bacanak 2021; Çelik, Baran, and Sert 2018; Gynne, Larsson, and Sert 2022; Hidson 2018; Körkkö, Morales Rios, and Kyrö-Ämmälä 2019; Seedhouse 2021; Sert 2019). These investigations have revealed that classroom communication is key for student learning, and that interactions in classrooms need to be established on a well-balanced integration of teacher-led activities and collaborative learning in student groups (see, for instance, Sert and Jonsson forthcoming). Research into interactional competences and skills in classrooms have led to the emergence of constructs like Classroom Interactional Competence (CIC, Walsh 2011, 2013), and IMDAT (Sert 2015).

IMDAT is a video technology-based teacher development framework that is micro-analytic and reflective, which recently integrated mobile technology into its developmental framework (Sert 2019, 2021). It involves a series of steps in teacher education that includes (I)ntroduction of CIC to teachers, (M)icro-teaching, (D)ialogic reflection on video-recorded teaching practices with the help of a mentor and/or a supervisor, (A)nother round of teaching, and (T)eacher collaboration for peer-feedback. Frameworks like IMDAT include reflective cycles in which teachers reflect on micro-details of their classroom interactional practices together with peers and mentors using videos from their classrooms. Analyses of classroom interactions have also increasingly been tied to interactions in post-observation feedback encounters and dialogic reflection sessions, as these meetings are interactional events in which teachers can notice aspects of teaching and learning (Kim and Silver 2016, 2021; L. Li 2019; Sert 2019). Known as post observation (feedback) conferences (POC; Jons 2019), these dialogic arrangements facilitate reflection-on-action (Schön 1987) for (student-)teachers.

Combining findings from POCs (or post observation feedback sessions) and video-recorded classroom interactions is in line with the claim that teacher education and

reflective practice should be data-led and evidence-based (Mann and Walsh 2017), as this has proven to be effective for teacher development, especially when (student)-teachers are given the opportunity to be engaged in reflective cycles using video-recordings from their lessons. Bozbıyık et al. (2021), for instance, used a mobile video tagging tool, VEO (also used in our study), which helps student-teachers and teacher educators to review annotated lesson videos for reflective purposes. The researchers showed how a focal student-teacher 'diversified her questioning practices to facilitate learner contributions' (114) after noticing aspects of her interactions and teaching using a CA-informed mobile video annotation tool with a university supervisor and a peer. It can, then, be argued that the utilisation of visual technology for reflection can operationalise positive change in interactional practices of student-teachers in classrooms. We do, therefore, need to identify and focus on interactional aspects of pedagogy that are, as Markee (2017) states, 'massively common' (380). These include instruction giving sequences, teacher questions, and teachers' responsive behaviours, like responding to students' correct or incorrect answers with positive or negative evaluation in order to provide feedback.

2.2. Responding artfully to student answers: a focus on negative evaluation

The ways teachers respond to learners' utterances in classrooms have received increased attention since the publication of the first classroom discourse studies (e.g. McHoul 1978; Sinclair & Coulthard 1975) as it has been shown that a great deal of pedagogical work is carried out by teachers when they evaluate student utterances in classroom interaction (e.g. Kaufmann, Larsson, and Ryve 2022; Lee 2007). Teachers' positive evaluations of student utterances (Waring 2008) as well as the ways negative evaluations are formulated (e.g. Park 2016; Seedhouse 1997) have attracted growing attention due to the educational value of feedback in learning (e.g. Hattie and Timperley 2007). Providing negative evaluation (e.g. when a student's answer is explicitly assessed as being wrong by a teacher), however, has been deemed quite controversial, as negative evaluation may 'create a sense of failure and frustration among students' (Tsui 1995, 43), while avoiding it may indicate to students that incorrect answers are generally problematic (Ingram, Baldry, and Pitt 2013; Seedhouse 1997).

Empirical investigations into negative evaluation, and in particular overt negative evaluation, have been carried out in different contexts including language classrooms (e.g. Seedhouse 1997, 2004), mathematics classrooms (Ingram, Baldry, and Pitt 2013) and reading tutoring (Netz 2020) sessions. Direct, overt negative evaluation of student mistakes (e.g. No!) has been linked to potential demotivation of students who get this kind of feedback. Seedhouse (1997) investigated an international dataset of 330 language lessons from 11 different countries and found only one case of a direct, unmitigated, overt negative evaluation by teachers, involving words like 'no' or 'that's wrong'. He argued that 'teachers perform a great deal of interactional work to avoid performing direct and overt negative evaluation of learner linguistic errors. When negative evaluation does occur, it is predominantly mitigated in some way' (Seedhouse 2004, 171). Likewise, based on data from mathematics classrooms, Ingram et al. (2013) also argued that 'teachers use a wide variety of interactional techniques to avoid directly and explicitly negatively evaluating a student's mistake during whole class interactions' (1). This might be due to the (perceived) need to avoid face-threatening acts, a finding in line with Park

(2016) who showed that teachers use a variety of strategies when disagreeing with student answers. As Richards put it (2007, 83), 'professional disagreement must be managed without recourse to "no"'.

Despite extensive findings on teachers' avoidance of overt negative evaluation in classroom interaction, recent research coming from tutor-learner interactions show that the phenomenon is not as rare in all educational settings as is claimed. Netz (2020) carried out a systematic analysis into repair sequences in reading tutoring sessions and showed that direct repair from the tutors can be commonly observed. The researcher stressed that directness in these feedback practices might 'take a toll in terms of pupils' face, whereas intensive investment in facework may redress this toll and facilitate cooperation and learning' (2020, 1). In other words, there are consequences of direct evaluations as face-threating acts, but these can be overcome by instructors. This reminds us of the paradox Seedhouse (1997, 2004) discussed: while teachers might be avoiding overt and direct evaluations due to potentially negative psychological outcomes, the pedagogical message given to students is contradictory since avoidance itself may mark students' errors as problematic, a position also advocated by Ingram et al. (2013). Both Ingram et al. (2013) and Seedhouse (2004), however, state that they do not have the intention to claim that teachers should use more overt negative evaluations, but that they need to be made aware of this phenomenon.

One way to make teachers aware of such micro-level details of classroom interaction is to integrate video recordings of teachers' own classrooms into teacher education programs to facilitate teacher noticing. We also need research methods that can identify microscopic details of interaction (e.g. conversation analysis), together with methods that can bring in situated reflections of teachers (e.g. interactional ethnography) embedded in their discourse to analyse and promote change and development. This is why in this paper we introduce and use Discursive Timeline Analysis that can combine investigations into collections of interactional phenomena from classrooms with the analysis of outside-of-classroom discursive data that links to classroom events. Given that teacher development is co-constructed discursively both within classroom interactions and during reflections on actions, a methodological plurality that combines conversation analysis of classroom interactions with complementary ethnographic evidence from collegial meetings and written reflections can better capture developmental trajectories. We elaborate on Discursive Timeline Analysis in the following section.

3. Methods and data

3.1. A development project: Digi-REFLECT

The overall aim of the research and development project that frames the present study is to enhance teacher development and teachers' roles in classrooms through a process of digitally enhanced reflection and feedback practices. The process of video-enhanced reflection and collaborative feedback in the project involved three interconnected steps: (1) a lesson is observed, video-recorded, and tagged (i.e. annotated) (either in-the-moment or retrospectively); (2) a triadic reflection and feedback session (post-observation conference, POC) is held between the student-teacher, mentor and a university supervisor, and (3) retrospective viewing and reflection is carried out by the student-teacher and mentor.

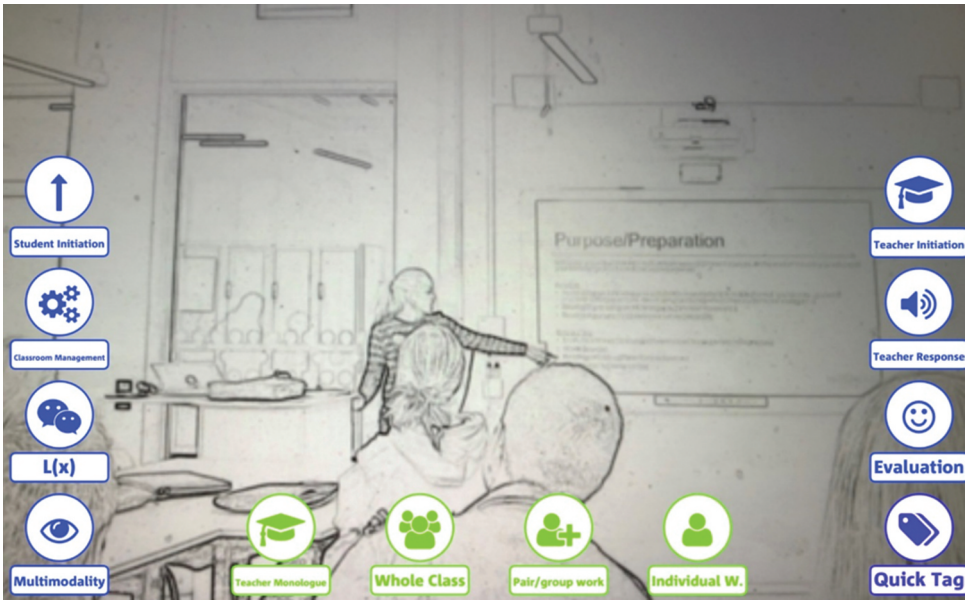


Figure 1. Practicum tagset in VEO.

In the project, a digital mobile video-tagging tool, VEO (Video-Enhanced Observation), was used as it enables both in-the-moment and retrospective tagging (i.e. digital annotation of videos on a mobile tool) with time stamps and reviewing of videos recorded in classrooms (see Aşık, Sert, and Miller 2024; Seedhouse 2021). Figure 1 shows how the tagset developed for this project looks in the VEO tool.

The tagset was developed by the researchers and teacher educators through workshops held with representatives of the teacher education unit as well as faculty members, and is based on research on classroom interaction and on the learning objectives within the teacher education course at the faculty where the Digi-REFLECT project was based (see the supplementary material for detailed descriptions of each tag). The premise is that teachers' ways of posing questions, evaluating students' answers, and responding to students' initiatives in conversations (Waring 2011) are important for pupils' learning. The tags were mainly based on findings from conversation analytic research into classroom interaction (e.g. Seedhouse 2004; Sert 2015, 2019; Walsh 2011) as well as teacher discourse moves (Herbel-Eisenmann, Steele, and Cirillo 2013) and talk moves (Kazemi and Hintz 2014).

In addition to giving the possibility to revisit each tagged moment in the video, the tool generates, based on the tagging, visual analytics on time spent on different communication modes while also providing frequency-based descriptive statistics on aspects of classroom interaction (see Figure 2 based on the first lesson of the focal teacher in this study).

3.2. Participants and context

This study is based in Sweden, where school-based education and practicum form an integral part of the initial teacher education (Jederud, Rytzler, and Lindqvist 2021). In Swedish universities, student-teachers take part in practicum three times during their 4- or 5-year

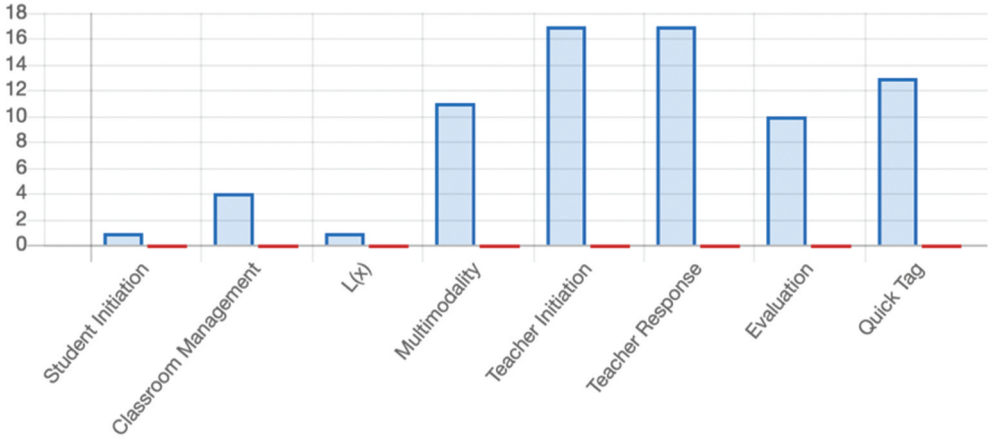


Figure 2. Visual output from annotated lesson videos (frequency of tags).

teacher education, the periods stretching from 5 to 10 weeks, summing up to 30 ECTS[2] credits. Triadic post-observation conferences (POCs, Jons 2019) and triadic mentoring (Bruneel and Vanassche 2021) – where a student-teacher, a mentor at the practicum school, and a visiting faculty member (i.e. a university supervisor) meet – form an integral part of each of the practicum period. POCs focus on the lessons observed (with or without video recording), but also on more overarching themes concerning the ongoing practicum (e.g. student-teachers' involvement in daily school activities). During the practicum, both general pedagogic and subject didactic aspects are explored and examined, which was also the case in our study.

Our broader project involved 10 different schools in five cities in Sweden, and we worked with 18 student-teachers, 15 mentor teachers and 6 university teachers during four academic terms. Our participants involve L2 English and Swedish, L1 Swedish, and Mathematics teachers and student-teachers in upper secondary schools based in two regions in Mid-Sweden. In this study, we focus on a case of a student-teacher, who was in her third year as a student-teacher of English (as an additional language) and Swedish. During her second practicum period (known as VFU 2 in Swedish), focusing on English, two lessons were observed and video-recorded, the first of them by a faculty member who gave video-based feedback together with the school mentor after the lesson. It should be noted that a POC after observation of a lesson taught by the student-teacher was already an integral part of the curriculum, so it has not been added as an intervention due to the research carried out. The second lesson was observed by a peer student-teacher, and was also followed by a POC, this time including the school mentor and the peer. During the observations, the visiting teacher educator from the university used an observation framework that had been used for teacher education in the last few years at the same university. The framework was transformed into an observation tagset that includes a focus on student and teacher questions, elicitation, teacher response patterns, evaluation, classroom management, language choice and multimodality (see Figure 1). The selection of the focal student-teacher for this paper was motivated by two reasons. First of all, the interactional phenomenon under investigation was a repetitive case in this student-teacher's lesson compared to other student-teachers. Secondly, the participants themselves oriented to this interactional phenomenon as something that needs to be reflected on (therefore, an emic

perspective) and focused on, which enabled us to track the use and avoidance of negative evaluation that follows learners' incorrect answers over time.

3.3. Data collection

The data in the project was collected during four academic terms, and a database of video-recorded and tagged lessons, POCs, interviews and written documents was built (see Figure 3). The whole dataset includes 18 audio-recorded POCs involving student-teachers, mentors, and faculty members, as well as 21 lessons video-tagged with VEO. We also conducted 23 semi-structured interviews with mentor teachers and student-teachers, and collected ethnographic data that includes lesson plans, course materials, reflection portfolios, and observation notes. The data for the current study in which one case is analysed in-depth and longitudinally includes two video-recorded 60-minute lessons with 20 pupils at upper-secondary school level, two (45 minute each) audio-recorded POCs, a 70-minute interview, student-teacher's written portfolio, and ethnographic field notes.

Following the ethical research guidelines of the Swedish Research Council (2017) and GDPR, informed consent forms were obtained from all participants before the data collection took place. Participants were informed that their participation is voluntary, and they could terminate their participation whenever they wanted without any negative consequences. Furthermore, pseudonyms have been assigned to participants to preserve confidentiality.

3.4. Discursive timeline analysis

The data in this study were analysed using Discursive Timeline Analysis (DTA, Sert 2023b). DTA is a methodological approach that identifies how participants orient to an interactional (and professional) phenomenon and tracks its use and change over time through a systematic analysis of discursive practices (e.g. classroom interactions, collegial dialogues, reflective text and talk). DTA draws on Conversation Analysis (Sacks, Schegloff, and Jefferson 1974) and Interactional Ethnography (Green et al. 2020).

Conversation Analysis (CA) takes a bottom-up perspective to the analysis of interactional practices in institutional settings, and it provides rich descriptions of situated activities with a focus on suprasegmental aspects of interaction like intonation, temporal aspects like length of silences, as well as multimodal aspects including gestures. CA was used in our analysis to build collections of a single interactional phenomenon that is situated in teaching and learning events and that also gets oriented to by the participants at other points in the dataset (i.e. emic perspective). Its analytic methods, namely

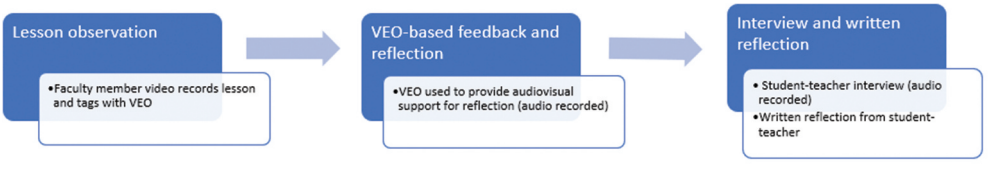


Figure 3. Data collection procedure in the project.

sequential analysis and next-turn-proof procedure were strictly followed in documenting the classroom interactions of the participants. We drew on Jefferson (2004) and Mondada's (2022) transcription conventions (see Appendix 1) to depict micro-details of interaction including temporal and prosodic aspects of talk as well as gestures.

Interactional ethnography (IE) examines teaching and learning related events in the moment, and across contexts, as they are experienced by teachers, learners, and teacher educators. IE documents telling cases, which are 'the detailed representation of ethnographic data relating to some sequence of events' (Mitchell 1984, 222). It explores what counts as ways of knowing in educational settings by identifying rich points for analysis and traces the roots and routes leading to events under investigation (Agar 1994, 2006). Drawing on interactional events and ethnographic documentation, IE takes a multifaceted approach to constructing evidence of learning, mapping the flow of activities across times, and tracing factors that support and/or constrain opportunities for learning (Green et al. 2020). Given that our study uses video-recorded interactions in the classrooms, recordings of POCs, and written student reflections in addition to ethnographic interviews, IE provided opportunities for us to track change of student-teacher behaviours and reflections over time across settings.

Combining CA and IE, DTA involves the following analytic steps:

(1) Identify a learnable or trainable in interaction, which participants themselves orient to as such (This can be a telling case in IE).
(2) Track, both retrospectively and longitudinally, occurrence(s) of the phenomenon in interactional events (e.g. classroom interactions). CA is used for this part of the analysis.
(3) Build a collection of cases using analytic methods of conversation analysis.
(4) Identify all instances of participants' orientations to the learnable across data, including those in written data and if available in (ethnographic) interviews. Note that the participant perspectives on the phenomenon should not deliberately be elicited (e.g. in interviews) after the conversation analytic treatment of data has started. IE is used for this part of the analysis.
(5) Compare collections and occurrences of cases across interactional events (e.g. two separate lessons) to document changes over time using conversation analysis.
(6) Connect two or more focal interactional events (e.g. lessons) to other ethnographic data (e.g. post-observation meetings when participants orient to specific moments in classroom interaction) and draw a timeline.

As mentioned above, IE was used to identify anchor points in our data, which the participants themselves oriented to as a learning objective. The student-teacher, mentor, and university teacher have focused on a phenomenon known as overt negative evaluation (henceforth ONE) during the POC. This phenomenon has been tracked in this study as an emerging learning goal, a learnable (Eskildsen and Majlesi 2018), both longitudinally (Markee 2008) and retrospectively (Jakonen 2018) across classroom videos, audio-recordings of POCs, reflective writings in student portfolios, and an interview, as illustrated in the timeline in Figure 4.

Initially, we identified an anchor point in the data, during the POC, when the participants brought up the issue of student-teacher's overt negative evaluation (extract 3), as they

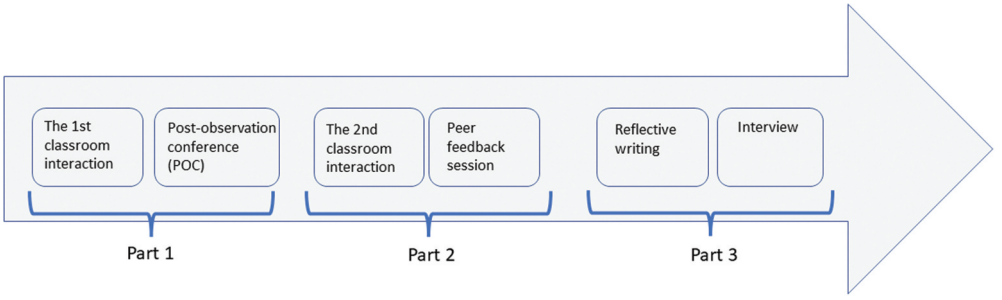


Figure 4. Discursive timeline analysis.

watched that moment from the lesson together to collaboratively provide advice for the student-teacher. We then tracked the phenomenon retrospectively in the data in the first lesson (see extracts 1 and 2), and analysed the particular sequence that was talked into being first using sequential and micro-analytic tools of multimodal CA. We then built a collection (Ten Have 2007) of all instances of negative evaluation (4 instances in the first lesson, and no instances in the second lesson) in the two lessons taught by the student-teacher. Using IE, we also tracked the phenomenon in POCs and interviews, as well as the written portfolios. By combining CA and IE, we were able to document the discursive journey of student-teacher learning as both evidenced in the classroom data and as reported by the participating student-teacher in other discursive events. Focusing on a single interactional phenomenon across time also made our case more unique and grounded in data and interaction, as evidence for our claims on learning and development are strictly bound to the use and avoidance of the interactional phenomenon and event that is talked into being by the participants themselves. If we had used only CA, we would not have been able to draw on data that are classroom interaction external. Likewise, the use of only IE would not have allowed a detailed, systematic investigation of the interactional phenomenon. In what follows, we will present the case through discursive timeline analysis in a number of stages (see Figure 4). In section 5, we will then discuss the affordances of DTA as a methodology.

4. Findings

In this section, the discursive events illustrated in Figure 4 will be presented in three parts to reflect the timeline of the focal student-teacher's development over time. In part 1, we show the student-teacher's (over)use of ONE in an observed lesson. We then demonstrate how it gets noticed during the POC within a collaborative advice-giving sequence, in which participants utilise the VEO tool. The tool enables the participants to watch the 'learnable' (Eskildsen and Majlesi 2018) together, hence affords the emergence of a 'learning object' (Hall 2018) for the student-teacher. In part 2, we document how the student-teacher avoids using negative evaluation (see Markee 2011 in relation to avoidance and change), and asks for feedback on her use of evaluation after the pupil's questions during the POC with a peer and mentor. In part 3, we show the ways the student-teacher reflects on the phenomenon under investigation in her portfolio and in the interviews, providing evidence of development in her understanding of the phenomenon.

4.1. Discursive timeline analysis part 1: The emergence of a learnable for the student-teacher based on the first lesson and the POC

Extract 1 comes from the part of the first English lesson when the teacher and pupils focus on literary terms, and the extract starts 17 minutes after the beginning of the lesson. During this stage of the lesson, the teacher wants to elicit literary terms from the pupils. The interaction unfolds in cycles of **I**nitiation-**R**esponse-**E**valuation/Follow-up format (Mehan 1979; Sinclair and Coulthard 1975). Our focus in the next two extracts is on how the teacher provides a negative evaluation in the third slot, following an incorrect response from one of the students.

Extract 1. Lesson 1, use of negative evaluation, Stock character, 17:04

```
01    T:    and ↑the:n we've got something fun↑ny:
02          (0.9.)
03          i ↑think (.) and that's stock characters.
04          >do you want to guess ↑what< this is.
05          (2.3)
06    S1:   like a character who's like in the background?
07→   T:    +↑n:o:: (.) ↑not real+ly.
      T     +->shakes  head        ->+
08    S1:   °o↓kay°.
09          %(2.4)                 %
      S1G   % withdraws mutual gaze%
10    T:    do you know what s↑tock is.
11          (5.2)
12          (you)say s↑tock* room.    *
      S2                    *raises hand*
13    T:    yeah?
14    S2:   maybe:: the characters ↓were(.) in the-
15          >beginning of the story< °like°.
16          (2.5)
17→   T:    n↑o::.
18          ehm if i say a stock room…
```

In line 04 T produces a known-information question (Mehan 1979), asking whether the pupils want to guess the meaning of stock characters. After 2.3 seconds of inter-turn gap, one of the pupils, S1, provides a candidate response in line 06. Note that S1's answer ends with rising inflection, which may indicate uncertainty. In line 07, the teacher delivers a direct negative evaluation (Seedhouse 1997) in turn-initial position, produced with rising intonation and stretching. Following T's ONE, the student, in line 08, produces an acknowledgement token with sotto voce (°o↓kay°), and demonstrates signs of disengagement through change of body positioning and gaze withdrawal. After 2.4 seconds of silence, T reformulates the initial question (line 10) and splits the phrase 'stock characters' into two separate units, asking the meaning of stock. This is followed by a very long silence, until S2 bids for turn and thus displays willingness to participate (Mortensen 2008; Sert 2015). S2 formulates his understanding of the word stock in lines 14 and 15. In the E/F slot of the IRF sequence, in line 17, T produces another ONE, this time preceded by 2.5

seconds of silence. Having received no correct responses, T goes on to explain the meaning of stock in the remainder of the sequence.

The following extract, from the same lesson, is another example of T's use of negative evaluation following an incorrect answer. In this phase of the lesson, the teacher introduces the types of literary works. After she has shown what a novel looks like, she moves on to another item. In line 01, she indicates the relative size of the book and in line 02, lifts it up and demonstrates it to the pupils. She sustains the position of her left arm and the book until the end of the extract.

Extract 2: Lesson 1, use of negative evaluation, Packet book, 03:34

```
01    T:    eh:m (.)the:n we've got a s↑maller o:ne.
02          +(0.9)          +
      T     +lifts the book up+
03          this (.) this one is: thirteen pages
04          it's really s↑mall (.) +takes,          +
      TG                           +looks at the book +
05          just a few minutes to read maybe twenty mi↑nutes.
06          (0.8)
07          do you wanna:(.)do you know what this is called?
08          (4.7)
09          it's good to k↑no:w (1.2) % yeah?          %
      S3                              % S3 bids for turn %
10    S3:   pocket book.
11→   T:    >pocket book< ↑N::O:.
12          (6.0)
13          if you look at it (.) it's not a very ↑long story.
14          it's ↑a:
15          (0.8)
16    S4:   a short story.
17    T:    +↑yeah (.)+it's a short story.
      T     +-> nods  ->+
```

T, between lines 03–06, provides information on the number of pages and size, and ends her description by telling how much time it may take to read the material (`maybe twenty mi↑nutes`). In line 07, she first starts off her turn with an incomplete question form, which, in the mid-way, is reformulated into a knowledge check question (Koole 2010) referring to the item in her hand (`do you know what this is called`), produced with an emphasis on the deictic marker (`this`). This question does not receive a response for almost 5 seconds. In line 09, T makes an evaluative comment on the value for knowing the name of the item (`it's good to k↑no:w`). In line 10, S3 bids for turn and provides an answer (`pocket book.`). In what follows in line 11, T first repeats S3's turn with increased pace and then produces a negative evaluation (`↑N:O:`) which is suprasegmentally marked with raised volume and stress. Note that this is also an IRF sequence like in the previous extract. What differs from extract 1 is that rather than providing an explanation, the teacher employs an elicitation strategy known as a designedly incomplete utterance (DIU, see Koshik 2002; Sert 2015; aus der Wieschen & Sert 2021). A DIU, as the name suggests, is an incomplete production of a turn that is designed to elicit a response by 'hinting' (Balaman 2019; Sert 2015; Sert and Walsh 2013). After 6 seconds of silence that follows the evaluation, T first provides a contrastive description (`not a very ↑long story`), and then stops, in

line 14, before providing a beginning of the answer. She uses rising intonation and stretching in turn final position (it's ↑a:), which is a typical feature of DIUs. S4's response to this DIU in line 16 demonstrates that this elicitation technique works in getting a response to the initial knowledge check question. The teacher, then, in line 17, provides an acknowledgement token in combination with nodding and repetition of the correct answer, which works as a positive evaluation.

In the first lesson, there is a total of 4 uses of (overt) negative evaluation by the teacher, presented in extracts 1 and 2. Extract 3, then, comes from the post-observation conference (POC), following the lesson where Extracts 1 and 2 were from, in which the student-teacher (ST), a university supervisor (US) and the mentor teacher (MT) met to discuss the observed lesson for collaborative feedback and reflection. The session takes place in the practicum school immediately after the lesson. Before the extract starts, the US has been providing feedback on a number of aspects of the lesson, ranging from how ST gave instructions in the lesson to how she used gestures and provided positive evaluation to pupils. The extract below starts at the 7th minute of the session. In lines 01–02, US starts a new feedback topic about the ST's use of ONE, three examples (out of 4) of which have been analysed in extracts 1 and 2. The extract below shows how this then turns into a collaborative feedback and advice-giving sequence, during which the VEO tool with tagged lesson moments and observation notes are available.

Extract 3: POC, collaborative feedback on negative evaluation, 07:51

```
01    US:  like (.) three or four times you said
02→       di↑rectly no: as well.
```

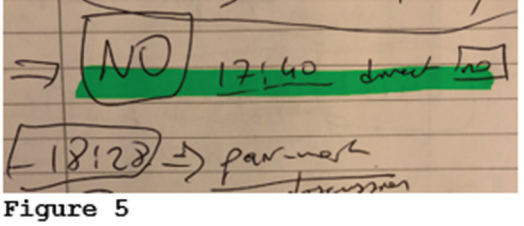


Figure 5

```
03          (1.1.)
04→         "↑no::"
05          (0.4)
06    ST:   hhh hh [hh ((ST Laughs))
07    US:          ["that's not it." ((animated voice))
08          sometimes you stop ↑there.
09          sometimes you provided an elabora↓tion(.)[but er:
10    ST:                                            [hmm
11→   MT:   i i i wrote that as ↓well (          )
12          not just say no: or "well maybe you're onto
13          something and go on".
14    US:   hmm.
15    ST:   hmm.
16→   US:   er: maybe ↑here: (((they watch the video together))
```

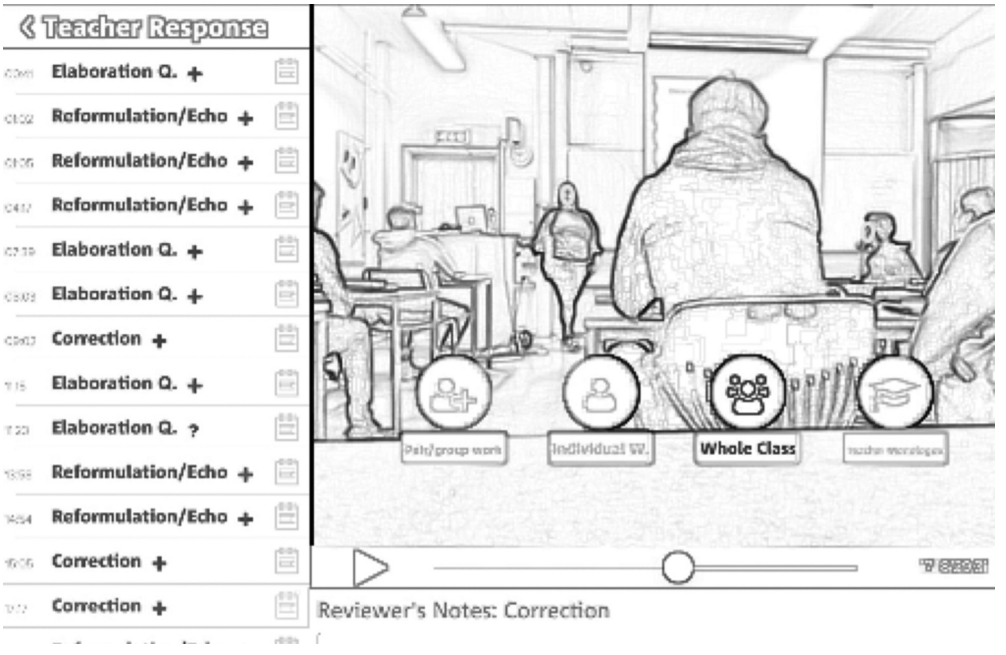


Figure 6. The VEO screen the participants see as they watch the sequence in extract 1 together.

In lines 01–02, US formulates an observation stating that ST used negative evaluation directly, which is also visible in the observation notes (Figure 5) of the US. In line 04, US revoices the ONE ("↑no::"), which triggers laughter from ST in line 06. In line 07, US completes his animated reformulation of ST's negative evaluation, followed by an analysis of how ST continued her talk in the classroom after the ONE in lines 08–09. This is aligned by ST with an acknowledgement token (line 10). In line 11, the mentor teacher (MT) obtains the floor and aligns with US's observation, starting a collaborative feedback/advice giving sequence. She does this by repeating the first personal pronoun three times, which can be an attempt to compete for the floor given that there was an overlap in the previous turns. She highlights her observation by stating that she also had produced a written account of this observation (i i i wrote that as ↓well), and gives advice in alignment with US's feedback (not just say no:). She further extends her advice-giving turn by providing ST with an alternative formulation to be used in such situations in classrooms ('well maybe you're onto something and go on'). MT's advice is followed by acknowledgement through minimal tokens that may signal agreement (lines 14–15), and no disagreement emerges on this topic in the remainder of the session (or later, at least in our dataset). In line 16, US reinforces the given feedback by providing audio-visual evidence through VEO (see Figure 6), that is, by watching the sequence that includes negative evaluation together.

Two weeks after this first lesson, ST teaches another English literature lesson to the same group of students. This second lesson features no examples of ONE, although ST received answers to her questions that are demonstrably 'less than correct' (see extracts 4 and 5). This second lesson is also followed by a POC immediately after it was conducted. However, this POC does not involve the US. The POC is between the student teacher, the mentor teacher at the school, and a peer of the ST who used VEO to record and tag the session.

4.2. Discursive timeline analysis part 2: Evidence of change in teaching practices through the avoidance of negative evaluation in the second lesson and reflection during the POC

Compared to 4 instances of ONE that follows an incorrect student answer, the second lesson does not include any examples of ONE. The change from four times to zero, however, cannot alone be evidence for change. We need to be able to compare across the same activities, and try to identify if the teacher somehow shows less than preference towards student answers, so a claim can be made that ONE is being avoided. Extract 4 is a case in point. The extracts below are comparable as in both of the lessons, all the examples start with knowledge check questions from the teacher in IRF cycles.

Extract 4: Lesson 2, avoidance of negative evaluation, Sub-plot, 05:32

```
01   T:   do you know what a ↑sub plot is.
02        +(15.7)          +
     T    +scans the classroom +
03        do you not?
04        (2.3)
05        >do you wanna< guess? (1.0)based on the name?
06        (4.2)
07   S5:  °the opposite-°.
08        (0.6)
09   T:   +sorry?         +
     T    +->leans forward->+
10   S5:  the ↑OPposite.
11→  T:   >the opposite< +↑mm:::                          +
     T                   +->tilts head to the right and left ->+
12        (1.6)
     T:   +tilts head again
13   T:   coul- ↑can be: actually. +
     TG   +looks at S5  ..>
     T    +->nods repeatedly          ->+
14   SX:  °can [be? °]
15   T:        [↑can ]+be:
     TG             ->+
16        +er a sub plot is actually +a ↑secondary plot.
     TG   +-> looks at her computer->+     +->looks at S5   ->
17        usually its- this is ↑very lik- (.)
18        >seen as very clearly i-< in movies (.) something is
19        happening to this character and at the same time…
```

Extract 4 starts with T's knowledge check question (`do you know what a ↑sub plot is`). There is an extremely long silence that follows in line 02, which leads to an *epistemic status check* (Sert 2013) in line 03. After another relatively long silence in line 04, T reformulates the initial question in line 05 and asks if the students want to guess based on the name, which is a practice of giving a hint. Preceded by 4.2 seconds of silence, S5 provides a candidate response in line 07 (`°the opposite-°`). This is followed by T's open repair (`sorry?`), indicating a hearing problem possibly due to quiet delivery in line 07. S5 then repeats his response this time with a higher volume in line 10. Line 11 forms the beginning of the third slot of the IRF sequence

as T starts delivering an evaluation to the student's answer which indicates less than preference. Note that T does not respond with ONE here although the answer is, according to T, not (fully) accurate. In line 11, T first repeats the student's response with increased pace and then produces a particle that indicates (partial) disagreement (>the opposite< +↑mm:::). The dispreference is further highlighted through embodiment, when T tilts her head to both directions slowly while producing +↑mm:::. She further extends her 'less than agreement' by tilting her head to the right and left once more, which has been shown to be embodied displays of dispreference in classroom interaction in earlier studies (e.g. Duran and Sert 2019). This can be claimed to be an embodied mitigation to avoid a potential face-threatening act (Ishino 2022; Looney & He 2021; Sert and Jacknick 2015). Although T does not mark S5's response as incorrect in line 13, this was questioned by one of the peers in line 14. In line 15, T uses her computer as an epistemic source, and starts providing the answer to the question by explaining what sub-plot is. Note that the explanation differs from the student's answer, and T uses the word 'actually', indicating that the previous answer of the student was less than accurate. The extract clearly shows that T explicitly avoids an overt negative evaluation although the student's answer was inaccurate. In doing so, she performs embodied mitigations and provides an explanation. Extract 5 is another case in point to show the interactional work to avoid using 'no':

Extract 5: Lesson 2, avoidance of negative evaluation, Flash forward, 09:01

```
01    T:    er a flash ↑forward.
02          +(3.8)
      TG    + ->scans the classroom ->
03          £(not again)£
04          (5.1)
05          can anyone tell me what a flash forw- ↑forward is.+
      TG                                                    ->+
06    S6:   is ↓it (.)jumping over (.)a few events?
07→   T:    er can be: but it's al↑so:
08          +(1.0)                    +
      T     +moves left arm diagonally upwards+
09    T: when you just look ahead.
10    you see what is coming in the future. ((gives an ex.))
```

In line 01 T initiates the IRF sequence by asking the meaning of flash forward, which is again a known information question (Mehan 1979) given that the teacher displays knowledge later in the extract. Similar to the previous extract, this initial question is followed by a long silence, which is marked by the teacher in line 04 (£(not again)£), indicating that there have been long silences in this lesson before. In line 05 the teacher reformulates her question. This receives a response in line 06, as S6 gives a candidate response through self-selection. This turn also asks for confirmation as evidenced by the interrogative question format and the question intonation in turn final position (is ↓it (.)jumping over (.)a few events?). The teacher responds to this alternative answer with a possibility marker (can be:) although this is not necessarily the answer she expected. T continues to explain the meaning of flash forward herself by using a gesture, moving her arm upwards

diagonally to depict the meaning of 'looking ahead'. She further uses other gestures to demonstrate 'future' with her arms. This extract, therefore, also shows how the teacher avoids the use of ONE in the second lesson although she receives responses that are less than correct, or preferred. She further mitigates disagreement through embodiment.

Immediately after this lesson, the focal student-teacher, a peer that she has been working together with, and the mentor meet for a POC that was audio-recorded and lasted around 30 minutes. Note that this time the teacher educator (US) is not present. Throughout the session, they discuss different aspects of the teaching performance, including classroom management, instructions, etc., but the evaluation behaviour of the student-teacher is not mentioned. However, as seen in extract 6, the student-teacher brings up this topic. The extract starts with the final part of MT's feedback, which ST (in this extract ST1) responds to by thanking in line 03. In line 04, MT produces a sequence closer (that's ↑it), marking a possible end of the session. Yet, in line 05, ST1 starts producing a pre-sequence, which forms a multi-unit question (Duran and Sert 2021), for a question that requests feedback on her use of 'direct feedback'.

Extract 6: Peer/mentor feedback session, asking feedback, 16:13

```
01    MT:   you finished in a good way (.) so:.
02          (1.6)
03    ST1:  thank you.
04    MT:   that's ↑it ((smiles)).
05    ST1:  .hh ehm: (.) that ↑thing that ↓I: (.) got
06          ↑feedback (.)about be↑fo:re=
07    MT:   =yeah?
08→   ST1:  er might be ↓like (.) immediate feed↑back
09          (1.1)in:, (th-) c↑lassroom inte↑[raction.
10    MT:                                   [↑yeah
11→   ST1:  .hh (0.7)is that better now?
12    MT:   ↑YEah I think [so.
13    ST2:                [yeah.
14    ST1:  £ hh good£. ((laughs))
15→   MT:   >YEAH YEAH yeah< no: but you ↑are more aware of
16          what you answer and how you answer the students.
```

Lines 05 and 06 marks a reference to a past learning event (Daşkın & Hatipoğlu 2019) in that it indexes an incident (that ↑thing) of 'received feedback' (↓I: (.) got ↑feedback(.)about) in the previous POC (be↑fo:re=). In line 07, MT provides a go-ahead response (Schegloff 2007, =yeah?). The multi-unit question continues as ST formulates the aspect of classroom interaction she received feedback on (immediate feed↑back). In line 11, ST invites assessment (is that better now?), on her performance. In the following turn, MT provides a confirming response (↑Yeah I think [so.) that indicates positive assessment, joined by the peer teacher with an overlapping agreement token (yeah.). In line 14, ST1 responds to these positive evaluations with an assessment marker (£ hh good£) and laughter. Starting from line 15, MT further elaborates on her positive assessment by adding

that ST has improved her responsive behaviour in both the quality of the content of her answers (what you answer) and the way she delivers them (and how you answer the students).

The sequence is interesting in that ST elicits feedback from the MT and ST2, thus shows learner agency by taking the initiative for her own learning (see Jacknick 2011; Waring 2011). What is primarily interesting for us here is that she refers to the ONE she got feedback on, although at this stage her terminology use is not accurate, as she uses the term immediate feedback rather than evaluation. The discursive timeline analysis thus far has enabled us to track interactional behaviours and how they change over time. As the next and final step of the DTA, we will examine the focal student-teacher's reflections concerning ONE in the written portfolio and interview.

4.3. Discursive timeline analysis part 3: Reported development in student portfolio and interview

Throughout the practicum period, all student-teachers write a portfolio that includes their reflections on the practicum experience. In what follows, we will first show the ways the student-teacher reflects on the phenomenon under investigation in her portfolio. We will then present extracts from the final interview that specifically focus on her reflections on the use of ONE, bringing evidence of development as reported by the student-teacher. Here, it should be noted that the student-teacher was not asked about this specifically in the interview but she herself brings it up in response to a general question of the interviewer.

In extract 7 from ST's portfolio submitted one month after the second lesson, we can see that the feedback she received in the POC has anchored. In this extract she referred to the same interactional phenomenon: responding to students' wrong answers.

Extract 7: Written reflection, referring to ONE, at the end of the practicum period

After feedback from supervisors, I have noticed that I sometimes have to work with my ways of giving oral feedback in the classroom, and not being afraid to wait a minute extra for student answers to the questions I have asked. **I happened to be "dismissive" when students gave me the "wrong" answer,** which I understand may lead to them in the future not wanting / daring to answer my questions. Of course, **this is not something I purposely did** and it is therefore something that **I have really taken to myself and tried to improve during my VFU[1], as well as something I want to work hard to avoid in the future.** One thing **I did to start an improvement is that** I observed several different other practicing teachers to see how they handle such situations, and **asked teachers to observe how I work with this a little extra** when I complete my teaching **so that I can get continuous feedback.**

It is clear in this extract from the portfolio that ST refers to her use of ONE, and here she positions herself as 'dismissive' for doing that. She also provides an understanding of the potential consequences of ONE, claiming that such behaviour may lead to limited pupil participation in the future. She clearly states that she reflected on this and tried to improve during her practicum. She refers to her strategies to tackle the problem: she started observing how other student-teachers handle such situations, and asked for continuous feedback (extract 6, after the second lesson). This portfolio statement demonstrates that ST's reflection – on-action has already transformed into reflection-for-action (Schön 1987). In the interview on the digital-reflection framework and practicum experience, ST's developing teacher language awareness is visible in multiple instances, and there is further evidence, in the form of dialogic self-reports, that VEO experience enabled ST to notice her overuse of ONE and helped her change this interactional behaviour over time.

The following extracts represent all the instances in which ST brings up her use of ONE in the interview without explicitly being asked about it.

Extract 8: Interview, 'I feel that I did do better at the end', (refers to the tool and own development), 19:42

```
01    IN:  which aspects of your classroom interaction
02         you think worked well? (.) in your lesson.
03         (2.2)
04    ST:  ((lines omitted in which she comments on her use of
           gestures, materials, and teacher initiation for
           slightly more than one minute))
05→   ST:  and: (.) >obviously< the: the evaluation
06         £we talked about thhat one£ (.) .hh that was
07         the one ↑that- (0.8) because >of of< this thing
08→        ((refers to VEO)) I could actual↓ly (0.3)
09         er ↑work on that one.
10         (0.8)
11         >so I could go back and check<.
12→        <a:nd I feel ↑that> (1.1)er I did do: (0.9) better at
13         (0.7) the end. (0.9) e::hm=
```

In the beginning of the extract, IN asks a general question that is designed to invite self-assessment from ST about the things that worked well in her classroom interactional practices (lines 01–02). Following a long description by ST (lines omitted due to reasons of space), ST brings up her evaluative responses and argues that the reason the evaluation aspect is better now is due to her use of VEO to work on it (lines 05–09). When she states that they 'talked about that one' (line 06) she refers to the POC as in this interview this issue comes up for the first time. In line 11, she refers to the review feature of VEO and in lines 12 and 13 claims that she eventually became better at the end. The extract brings self-reported evidence for the effectiveness of the digital reflections and the affordances of the tool, as ST claims that due to her use of the tool and her work with it, she improved and changed her classroom behaviour.

Two minutes after the end of extract 8, IN asks ST to reflect on an instance in which she would have wanted to act differently. Out of multiple options that could have been brought up, ST mentions ONE.

Extract 9: Interview, 'I wasn't really aware that I was doing that before' (use of terminology and offering alternatives), 22:20

```
01    IN:  can you reflect on an instance which (0.8)
02         .h which YOU: would have wanted to act ↑differently.
03         (1.5)
04    ST: ↑Yea:h (.) that is th- the thing that I: (.)
05         got commen↓te:d=
06    IN:  =hm hm.=
07    ST:  =o:n (.).h >when we did it<, and that was my:
08→        er e↑valuation af[ter =
09    IN:                    [uh huh.
10    ST:: =I got- (0.3) an answer. ((ST laughs))
11    IN:  so: (.) rather than: (.) directly saying no:,
12         you would do: something ↑else maybe:.=
13→   ST: =something else (.) maybe: ask >another< question
14         or: and that's what I di:d ↑after this les↓son
15    IN:  hm hmm.
16→   ST:  because (.) I >I didn't< really: >I wasn't really
17         a↑ware that I was doing ↑that (0.5) be↑fore.
```

ST, from lines 04 to 10, in response to the question on a critical incidence (Farrell and Baecher 2017), ST refers to ONE, describing it as her evaluative response after she received an answer. Note that ST laughs again as she did both in extract 3 when she first received feedback, and in extract 8, line 06, after she brings up this topic. This may be a way to deal with trouble or mitigating face as earlier research has shown (e.g. Looney & He 2021). In lines 13 and 14, ST continues to exemplify alternative actions she could have performed (`maybe: ask >another< question`), and also refers to her second lesson stating that she managed to do that eventually. In lines 16 and 17, she closes the sequence by providing an account of her initial behaviour, stating that she was not aware that she was providing ONE after students' responses. This indicates that she has developed an awareness over time, and her performance on evaluation in classroom interaction gradually changed. We can argue that there is reported evidence for her change of behaviour, which is further reinforced later in the interview, when the student is asked about an eye-opening moment as well as the final mention of her classroom interaction behaviour towards the end of the interview, presented in extract 10.

At the 51st minute of the interview, ST is asked about the reviewing functionality of the tool (`what do you think about the reviewing feature of the tool?`), which elicits a 2-minute-long response from ST, with positive assessment on the use of the review feature. Following that, in lines 01 to 05, IN asks if ST noticed a difference between her first teaching experience and the one(s) later.

Extract 10: Interview, 'It did make a difference right away', (reflection for action and change), 52:29

```
01    IN:  do you think ↑that (0.9) it made a ↑diffe↓rence
02         even in a short ↑time (.) to be aware of this
03         and getting feed↑back based on these things
04         when you te:ach >for example< .hh
05         for the ↑second ↓time .hhh eh::m ↑after that.
06    ST:  ↑yeah (.).hh >and that's< I- I'm gonna (0.3) have
07         that er as an e↑xample a↑ga:in (.) because
08         that's (0.4) what <I was> ↑focusing ↑on:. .hh
09→        that was the evalua↓tion (0.8) because .h
10         if ↑YOu: would have just been there and
11         SAID to me: <" ehm your evaluation wasn't g↑reat>(.)
12         because you just said this" (1.1) maybe: I would
13         ↓say, (.) "o↓kay" (0.6) and I'd continue doing it.
14         but when [you:  ]=
15    IN:           [uh huh]
16→   ST:  =say ↑that (.)and you↑SHO:W me:(.) what I've ↑do:ne,=
17    IN:  =uh huh.
18          (1.0)
19→   ST:  the:n >I can say< "A: ↑HA: o↑kay yeah >I get what
20         you me:an,< (.) I need to ↑work on ↑that".
21    IN:  uh huh.=
22    ST:  =so y- (.) ↓ye:ah (0.6) in ↑that wa:y, (1.9)
23→        er: it did make a >er er er< dif↓ference(.)
24         right a↑way,
25    IN:  uh [huh.
26    ST:      [because I- I ↑HA:d something to: (.)
27         to work f: f↑ROM.
```

Between lines 06 and 14, ST brings in the issue of her use of evaluation again, rather explicitly in line 09. She accounts for that and explains how the use of the tool together with the feedback has made a difference, by stating that it would not have made the same impact if the feedback received had been just through 'words' (line 11, SAID to me). She argues that only verbal feedback may not have changed her classroom behaviour (line 13). She then goes on to emphasise the fact that it made a difference to show (visually), through the VEO app, what she has done in the classroom (SHO:W me:(.) what I've ↑do:ne,) in line 16. The visual demonstration, according to ST, created an aha moment (line 19), which indicates noticing and awareness. Line 20 is also important in that ST refers to her continued work (I need to ↑work on ↑that) and this, according to her, also contributed to change and development, or in ST's words in lines 23 and 24, a difference. All in all, the extracts from part 3 of our discursive timeline analysis bring evidence to support the reported change in the ST's classroom interactional behaviour, while also explicating the affordances of the digitalisation in reflection and practices in initial teacher education, as complementary to the interactional evidence we presented in the first two parts.

5. Discussion and conclusion

Our discursive timeline analysis brought interactional evidence (4.1 and 4.2) for change of classroom interactional practices of a student-teacher, with a focus on negative evaluation. As

our representative examples (extracts 1 and 2) have illustrated, the student-teacher has deployed negative evaluation using 'No' following learners' incorrect answers four times during the first lesson. This has been avoided after the evidence-based collaborative advice (extract 3) as demonstrated by the avoidance of the use (extracts 4 and 5). The change from overuse to avoidance marks a change and development, as conceptualised by Jenks (2010) and Seedhouse (2010). This change was afforded by data-led reflections and collaborative feedback encounters, systematic analysis of which brought evidence for reported development of the student teacher (4.3), as she requested and received feedback on her change in the second POC (extract 6), reflected on it in her written portfolio (extract 7), and further elaborated on the change of her practices and her own professional development during the project interview (extracts 8, 9, 10).

The study has confirmed the findings of earlier studies that focused on video-based teacher education and development, in particular those that emphasised the value of teacher noticing of classroom interactions (e.g. Ding, Glazewski, and Pawan 2022; Sherin and van Es 2005; Sun and van Es 2015; van Es and Sherin 2002). Gaudin and Chalies (2015) stated that 'in coming years it will be important to study the similarities and differences between identifying and interpreting relevant classroom events on video and *performing these same activities in the classroom* [our emphasis]' (57). In response to this call, we showed that teacher noticing and reflecting on aspects of classroom interaction using videos can result in transformation in future teaching practices and in teachers' interactional competences. Going beyond videos, as the present study did, the use of conversation analysis and classroom interaction research-informed video-annotation tools bring unique affordances for teacher development by enabling rich reflections and evidence-based feedback. For such initiatives to be effective, we need to integrate cycles of reflective practice into classroom-interaction focused teacher education curricula (e.g. Y. Li and Walsh 2023; Sert 2019). VEO-enhanced teacher education frameworks that focus on classroom interaction can also be extended to continuous professional development where teachers and researchers collaborate using action research (see Sert and Jonsson forthcoming).

Based on our findings, we argue that an empirical focus on specific aspects of classroom interaction (e.g. evaluating student responses, corrective feedback, teacher questions) in teacher education can facilitate teacher development. In our study, the mentor, the university supervisor, and the student-teacher oriented to negative evaluation as a teacher move overuse of which should be avoided. This is what earlier research has shown as well: Sun and van Es (2015) claimed that in mathematics classrooms incorrect answers should be followed bye-xtended discourse to foster disciplinary understanding, while Seedhouse (1997) showed that in language classrooms, teachers avoid overt negative evaluation. Although what earlier research documented and what our participants did are more or less parallel, we still should be cautious in that there is no one-size-fits-all solution to the treatment of incorrect answers and the use negative evaluation. Interactional moves like correction and evaluation are highly context sensitive and subject specific. 'Responding artfully' (Waring, Reddington, and Tadic 2016) to student utterances is a sine qua non of facilitating interactions in especially whole-class settings. This involves teachers' attentive listening of student responses, and rather than closing interactional space with a direct positive or negative evaluation, interactional moves like seeking clarification, asking elaboration questions, inviting contributions from other students need to be used in alternation. New teachers need guidance to notice these moves and eventually integrate them into their teaching, and this requires teachers to use videos for

development. Körkkö et al. (2019) called for video-based research that reveals 'the processes that lead to change in teacher thinking and practice' (36). Our study responded to this call by providing micro-level details of such processes and by documenting how change occurred over time, tracking inter-linked discursive practices across events.

With our Discursive Timeline Analysis approach we tried to break methodological ground by combining Interactional Ethnography and Conversational Analysis. CA provided us with a micro-analytic lens to analyse situated teaching and learning behaviours while also enabling us to see POCs and interviews as discursive events. Combining CA with IE in the DTA is in line with the arguments by scholars like Seedhouse (2022), who claimed that 'it is possible to explicitly combine CA and ethnographic information in a mutually reinforcing way' (7). We want to emphasise that our complementary data collection tools were not designed to elicit reflections specifically on 'negative evaluation', and that the emergence and development of the learnable was revealed in naturally occurring interactions. One may argue that the existence of an interview may actually 'violate' the naturalness of the finding, but again; the moments when the student-teacher remembered and reflected on the focal learnable were not triggered by questions asked specifically about 'negative evaluation'. In spite of its challenges, we consider this methodological and analytic approach to be a promising way to conduct teacher noticing research and other evidence-based (e.g. video based) teacher education and development research that focuses on classroom interaction.

Notes

1. We would like to thank Tom Koole for encouraging us to highlight this point.
2. ECTS refers to course credits in the European higher education system.

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Appendix 1. Transcription conventions (adapted from Mondada 2022)

.	final falling intonation
,	continuing intonation
?	interrogative intonation
↑	rising intonation
↓	falling intonation
hhh	outbreath
.hhh	inbreath
what	word emphasis
>what<	speech that is quicker than the surrounding talk
<what>	speech that is slower than the surrounding talk
WHAT	speech that is louder than the surrounding talk
wha:t	prolonged vowel or consonant
wha-	cut-off word
(what)	uncertain hearing
[what]	overlapping talk
=	no break between utterances or units of talk
((incorrect))	transcriber's comments
(1.5)	silence in seconds
(.)	micro pause
+%÷*	Each participant in an extract is assigned a symbol. The symbol in a line of talk indicates the beginning/end of a focal embodied action that is explained underneath the line for talk.
TG	Gaze of the participant is marked in this line.
T	Other embodied actions of the participant are marked in this line.
-> ->	Action continues across subsequent lines until the same symbol is reached.