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**To cite this article:** Kamilla Klefbeck & Mona Holmqvist (2023): Using Video Feedback in Collaborative Lesson Research with SEND Teachers of Students with Autism - a Case Report, International Journal of Disability, Development and Education, DOI: [10.1080/1034912X.2023.2212603](https://doi.org/10.1080/1034912X.2023.2212603)

**To link to this article:** <https://doi.org/10.1080/1034912X.2023.2212603>



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Published online: 15 May 2023.



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# Using Video Feedback in Collaborative Lesson Research with SEND Teachers of Students with Autism - a Case Report

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## ABSTRACT

This study used video feedback in a collaborative development study to help improve teachers' perceptions of the learning needs of students with autism spectrum disorders (ASD) and intellectual disabilities (ID) and enhance their active participation in the classroom. Crucially, teachers need the necessary skills to discern students' subtle communications, as students with ASD and co-occurring ID may have reduced or non-existent verbal language and may express their needs mainly through behaviours. The first author video recorded ten classroom lessons and collaborated with three teachers to discuss the recordings in six meetings over the course of one semester. The data used for the analysis was taken from the first (February) and last (June) collaborative meetings of the semester. The results show how collaborative video feedback can influence teachers' judgements about students' learning and further their professional development; the subtle signals that students use to communicate become more visible when the video recordings are viewed multiple times. The collaborative discussions facilitated the teachers' understanding of students' behaviours and actions. In addition, the teachers' focus shifted from identifying general aspects of their students' behaviours to their skills and knowledge.

## KEYWORDS

Autism spectrum disorders; collaborative; intellectual disabilities; professional development; Special Educational Needs and Disabilities (SEND); video feedback

## Introduction

All students have the right to achieve their full potential through education. This is in line with Article 12 of the Convention on the Rights of Persons with Disabilities (CRPD) which establishes equal recognition of all aspects of life before the law (UN General Assembly, 2007). Many students with autism spectrum disorders (ASD) and intellectual disabilities (ID) cannot use verbal language to express themselves and communicate their needs. Therefore, it is more difficult to understand their needs than it is for students who do not have communicative impairments. The American Psychiatric Association (American Psychiatric Association, 2013) describes autism as a lifelong disorder characterised by barriers to social communication and interaction, and the occurrence of restricted and repetitive behaviours or interests. The American

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Psychiatric Association (2013) characterises ID as intellectual and adaptive behavioural deficits. Almost one-third of children with ASD have a concurrent intellectual disability (Speaks, 2017). Tanet et al. (2016) found that for children with ASD and co-occurring ID, it is crucial that teachers understand ASD, make appropriate adaptations, and use teaching strategies that build on children's interests. For students with severe communicative and cognitive difficulties, teachers are key for supporting their active participation in the educational environment. Pramling et al. (2019, p. 176) state, 'We understand teaching as an activity. As such, it is co-constituted by the coordinated (responsive) practices or actions of participants'. This mutual process of actions and learning requires teachers' responsiveness to students' intentions and abilities (Pramling et al., 2019). Similar conclusions were drawn by Klefbeck's (2021a) systematic review, which summarised the findings of studies on approaches to developing communication skills in children with co-occurring ASD and ID. The review showed that educators' attention and responsiveness to the needs of students had a decisive influence on their opportunities to communicate and, thus, on the further development of their communication skills. Findings from Bentley-Williams et al. (2017) indicate the benefits of collaborative alliances between universities, researchers, and teachers to develop deep understanding and support for students' needs in SEND teaching. The researchers highlighted the benefits of implementing pedagogical theory to enhance SEND teachers' reflexive learning.

The present study aims to contribute to the literature on teaching for SEND by investigating how video-based feedback can improve the skills of SEND teachers and enable students with ASD and ID to actively participate in the classroom. Our concept of active participation is understood through the framework of research and practice in teaching for students with moderate to severe intellectual disabilities. Students with severe intellectual disabilities may never become fully independent, but they can always become more active and thus improve their participation in life. Therefore, active participation can be considered an improvement when compared to partial participation. Student participation in the present study's context refers to active participation in education, with a focus on student learning (Cooper & Browder, 2001).

The strength of collaborative approaches, where professionals and learners are at the centre of the research, is highlighted in van Oorsouw et al.'s, (2009) meta-analysis of good practices for improving professionals' abilities to engage and interact positively with people with ID. Their meta-analysis found that training programs that combined coaching with feedback (verbal or in combination with video) were significantly more effective than those that included just coaching or correctors. However, van Oorsouw et al. (2009) did not find sufficient evidence to determine whether video combined with feedback was more effective than verbal feedback alone. In the study by Meadows et al. (2020), an intervention was conducted using video feedback as a tool to enhance staff communication skills with adults with learning difficulties. Meadows et al. (2020) concluded that video, in combination with feedback, improved professionals' skills by enabling functional communication. Meadows et al. (2020) highlighted the role of the facilitator and suggest that the facilitator should tailor their feedback to meet each staff member's progress, as active facilitators offer opportunities for reflection and adapt each participant's training. The assumptions of van Oorsouw et al. (2009) and Meadows et al. (2020) about the relationship between feedback and conditions for targeted behavioural change is

consistent with that of the OECD (2019), indicating that those teachers who receive the most feedback emerge as most confident.

The present study analysed guided video feedback in a collaborative classroom project for SEND teaching with children with ASD and ID to find the gains in active participation that video recording can bring to students. The present study addresses three different dimensions: first, guided collaborative video-based feedback to support teacher development; second, teacher development for promoting active educational participation in students with ASD and ID; and third, teachers' perceptions of students' learning needs.

### ***Video Based Feedback Provides Opportunities for Behavioural Improvement***

Miller Scarnato's (2018) literature review provides evidence for understanding the relationship between video feedback and awareness of oneself and others. The review examined the benefits of using video- or film-recording in social services settings. Miller Scarnato (2018) found that viewing oneself through sequences of video recordings provides the distance necessary to support self-awareness and improve the conditions for self-correction to support vulnerable populations. In Waitoller and Artiles's (2013) systematic review, which focused on teachers, or other school staff's development in the context of inclusive education, only 5 of the 46 included studies reported on student experience. Waitoller and Artiles (2013) revealed a research gap in terms of methodological perspectives, as most articles in their review reflected teachers' views expressed in interviews or questionnaires. They called for additional research focusing on situated practices where teachers' own experiences related to student outcomes. The present study also addressed Waitoller and Artiles's (2013) suggestion to analyse video- or audio recordings, to obtain rigorous data and examine teachers' professional development and students' learning.

### ***Teacher Development Through Video-Based Analysis***

In the context of SEND, the systematic review by Morin et al. (2019) examined the relationship between video analytics interventions and improvements in the professional development of special educators. Their results showed that the use of video generally improved their skills. The only statistically significant result was the effect of video analysis for teachers with comparably short teaching experience. Morin et al. (2019) concluded that future studies should conduct in-depth analyses based on educators' qualifications and other characteristics recognised in different educational institutions.

### ***Perception of Students' Knowledge and Abilities***

We used Flutter's (2007) concept of listening to students' voices in the present research context focusing on teachers' awareness of students' abilities and opportunities to engage in learning activities. Flutter indicated that listening to students' voices positively influences their learning and provides teachers with information about alternative strategies to organise teaching and promotes their knowledge about students' efforts. Flutter's research does not focus on SEND teaching, but it points out that more skilful students get their teachers' attention more often than less talented students. Flutter

concluded that listening to students' voices primarily promoted the learning success of the least successful students.

Klang et al. (2020) reviewed instructional practices among SEND teachers in Swedish Compulsory School for Students with ID (CSSID). The results indicated that teachers in special schools reported significantly lower expectation of students' learning, but more frequently supported their social participation. Klang et al.'s, (2020) findings were based on teacher surveys, which were considered insufficient as there were no data on the teachers' observed instructional practice. Similar conclusions on the need for multiple data sources were drawn in Klefbeck's (2021b) lesson-study project, which used situated practice to examine changes in teachers' professional development in the context of SEND teaching in CSSID. The case study evaluated a student's school navigation using teachers' observation protocol and a few sequences of video and photos to assess the student's abilities for active educational participation. However, in Klefbeck's (2021b) study, participating teachers had very few opportunities to contribute to videos or photos; therefore, the data relied on the teachers' perceptions, and the researcher had few opportunities to conceptualise the teachers' perspectives. The results of the study suggest that the observed variation (Pang, 2003) could have been an efficient, collaborative analysis of video recorded lessons.

### *Aim and Research Questions*

This study aimed to investigate how video feedback in a collaborative development project improves teachers' insights into the learning needs of students with ASD and ID to promote their active educational participation in the classroom.

**RQ1:** What characterises teachers' perceptions of student knowledge and abilities as developed through their collaborative reflections on video recorded lessons? (Teacher responsiveness).

**RQ2:** How do teachers capture student development changes using guided video-based feedback? (Students' active educational participation).

**RQ3:** How do teachers share and transfer knowledge of student skills through collaborative analysis of video recordings? (Shared professional knowledge and beliefs).

The content analysis is guided by variation theory (Marton, 2014), as it focuses on the aspects of teachers' discussions that are critical for identifying their understanding of knowledge development. This means – to distinguish critical aspects in parts that the learner has not yet determined but must distinguish to be able to develop learning, variations of the content's aspects are offered to the learner. Through a variation theory perspective, teachers and researchers can analyse how learning takes place by qualitatively noticing differences in how the aspects are expressed (Marton, 2014).

## Materials and Methods

The data in this study consist of two transcribed collaborative sessions, with the first and last sessions framing a collaborative professional development project. To grasp which aspects of teachers' discussion that could be understood as critical for their learning, a qualitative thematic analysis has been conducted, focusing on teachers' expressed knowledge and attitudes. In the first step, the deductive analysis was limited to three themes identified in the research questions. This means the themes are deductively generated (Kiger & Varpio, 2020); however, the sub-themes within each main theme are inductively generated. Data was also summarised in descriptive statistics (Cooksey, 2020) to unveil trends and general patterns in data from each theme. Both analyses are used to enhance the reliability of the study's main findings.

## Participants

The present study was part of a multi-stage project that sought to explore the development of teachers' practice in the context of CSSID, with a focus on active participation in education. The present study followed a previously conducted lesson study project (Klefbeck, 2021b) in the context of SEND teaching for students with ASD and ID. The teacher-participants in the present study, had participated in this previously conducted study, and the first author had used student data collected by the teachers for analysis. The crucial difference was that the present study also included data collected through the first author's presence in the classroom. The follow up procedure enabled the teacher participants' familiarisation with the research process. The recruitment of the participants was proceeded through a process that most closely can be defined as reverse, as the school leader contacted the authors. The principal of a school with a total of 450 students (aged 6–15) in southern Sweden contacted the first author. The principal had heard that researchers were looking for research contexts to develop teaching for students with intellectual disabilities. The school organisation in which participating teachers and students were enrolled can be identified as typical for the context, as students and teachers who participated in the research were internally segregated within the school through placement in separate groups locally integrated into the school buildings. This way of locating SEND student groups is consistent with how teaching for students with ID in Sweden is generally organised. Before the data collection started, the first author informed teachers, students, and guardians during an open house meeting (28 May 2019). Information letters and consent forms were handed out to students, guardians, teachers, teacher-assistants, and school management. The students were given consent forms, even though they could not read or had limited word comprehension, to highlight the importance of the student's position. The students' consent letters included instructions that guardians were allowed to sign for students who could not sign it themselves – but the guardians' signature required that the student had been informed. Data were only collected from informants, teachers, teacher-assistants, and students (as well as their parents) with their informed consent. During video recording, the researcher (first author) was attentive to the participants' signals of stress or reluctance and

**Table 1.** Teacher participants.

Participant	Age	Gender	Degree	Work experience in years (current school) vs experience as SEND teacher.
Teacher A	48	Female	Teacher certificate, SEND teacher	1 (28)
Teacher B	50	Female	Teacher certificate, SEND teacher	1 (31)
Teacher C	50	Female	Teacher certificate, additional not yet completed SEND teacher	1 (3)

immediately stopped recording if those signals appeared. The study received ethical approval from the Swedish Ethical Review Board (2019–02767).

Three teachers and one researcher participated in the analysed collaborative meetings, focusing on the conditions under which students with ASD and ID can actively participate in the classroom. (See [Table 1](#), for clarification.) In this educational context, SEND teachers' responsiveness to learners' communicative attempts were counted as requirements. Data collection was performed according to the ethical guidelines of the Swedish Research Council (Vetenskapsrådet, 2017).

### Context of the Study

Following Bentley-Williams et al.'s (2017) recommendation for sustainable professional development targeting SEND teachers' reflexive practice, pedagogical theory was implemented in the collaborative proceeding. As most of the student participants had a combination of ASD and ID, the collaborative discussions were grounded in Holmqvist's (2004, 2009) textbook on educational perspectives of learning for people with autism, and the first author and teachers together discussed some of its chapters.

The present study used a three-step process for guided video feedback. To begin with the first author video recorded classroom lessons and analysed the recordings. The first author then shared the analyses with three teachers in collaborative meeting sessions. These sessions were videotaped and analysed. Finally, reflections on a previous session were formulated and given to teachers as feedback at the next meeting session. This iterative process was used as a professional development tool to help teachers understand their students' needs.

### Procedure

The first author made regular visits to the classroom during one semester (the spring semester of 2020); in between those visits, collaborative discussions with the teachers were held. Between the first and last collaborative discussion, which were used to discern changes before (pre-) and after (post-test data) the intervention, four cycles of collaborative lesson research were conducted. The following procedure was used: study phase (the topical focus is defined built on team members' knowledge); plan phase (learning goals, based on students' current understanding, are set, and the lesson plan is developed as a bridge between students' previous understanding and the object of learning); teaching phase (one teacher performs the lesson, the other observes, which provides a shared

**Table 2.** Data collection.

Month	Collaborative meetings		Classroom observation	
	date	Duration (h)	date	Duration (h)
February	26	2		
March			11	2
	17	2		
April	1	1 ½	1	2
			15	2
	22	1 ½	22	2
			29	2
May			6	2
			13	2
	14	2		
			20	2
			27	2
June			3	2
	10	1 ½		

experience of teaching); and reflection phase (teachers' share their experiences and are given opportunities to develop their teaching plans). Through these steps, students' learning can be influenced by teachers' professional knowledge and beliefs (Lewis et al. 2019). In total, there were six collaborative discussions in the entire project. Between the collaborative discussions the first author made classrooms observations and video recorded the teaching sequences (for clarification see Table 2) in which the teachers implemented the lessons that had been collaboratively planned. In the first joint session, the teachers provided the video recording, thereafter, the first author contributed with selections of video recorded sequences to the collaborative meetings. A summary of the collaborative procedure is given in Table 3, collaborative meetings procedure.

### Analysis

A combination of qualitative and quantitative approaches was used to analyse the first and the final videotaped collaborative meetings, including narrative assessments of the transcripts. To identify patterns in teacher learning (Holmqvist, 2011) the study used an inductive *whole-to-part procedure* (Erickson, 2006). First, the two researchers calibrated their understanding of how to identify the teachers' verbal expressions for each theme. Next, the researchers conducted independent analyses of the material, following a codebook that established three themes for analysis:

First theme (RQ1): Capture characteristics of teachers' perception of students' knowledge and abilities not connected to a specific student.

Second theme (RQ2): Capture teachers' descriptions of students' development changes.

Third theme (RQ3): Capture teacher shared/transferred knowledge of student skills but need not refer to specific students; may include general-level statements.

Initially, of a total of 100 pages of transcripts analysed, the researcher conducted calibration checks of the first 14 transcribed pages. The researchers identified and marked 20 parts of the teachers' verbal talk. Of these markings, nine were identified by both researchers, while 11 were identified by only one of the researchers,



**Table 3.** Collaborative meetings procedure.

Date	Researcher and teachers' preparation	Content of the meeting	Mutual decision – Plan
26 February	The teachers provided sequences of video recorded teacher-student <sup>a</sup> interactions for the researchers before the meeting. Teachers' independent contemplation about challenging learning issues.	The teachers' shared their thoughts about challenging pedagogical issues. The researcher presented the object of learning: the teachers' attention/awareness of the students' signals, and the students' communication.	The researcher presents a plan, the object of learning. Joint reading of Holmqvist's (2004) book about autism and learning.
17 March	The researcher was provided with sequences of video recorded lessons, and prepared sequences to share with the teachers.	Joint analysis of the video recordings. First chapter of Holmqvist (2004) textbook about autism and learning was discussed.	Continue reading Holmqvist's book.
1 April	The researcher provided feedback to the teachers acquired from previous collaborative session, and from the lesson observations.	Second chapter of Holmqvist (2004) discussed. During the meeting it become clear that increased opportunities for communication and participation in the classroom not only relied on students' abilities and knowledge, but also teachers' knowledge about students' learning. For example, not until the teacher showed one student that she understood a particular sign, could the student use the sign to communicate with this teacher. The researcher shared reflections that the paraprofessionals observed in the classroom used different strategies when communicating with the same student.	During the meeting, the teachers decided to collect one student's already known communication. Decision: to request response.
22 April	The researcher provided video supported feedback and introduced a theoretical concept to the teachers - <i>alteritet</i> - to take joint activities in a new direction.	Third chapter of Holmqvist (2004) discussed. The teachers and the researcher analysed teaching sequences together. They shared thoughts about an exciting sequence in which one student wrote her name on a sunscreen tube, which showed how the teacher's interest enhanced the student's commitment to learning.	
15 May	The researcher provided video supported feedback to the teachers.	The teachers' efforts to increase focus in the morning class were summarised: clarifying visual tools, placement of the furniture in the classroom, use of a microphone, and teachers' commands for the teacher-assistants to sit down during the morning class, to act as models for the students. Strategies for supervision of the students who wanted to participate, but at distance.	Enable distance.

*(Continued)*

**Table 3.** (Continued).

Date	Researcher and teachers' preparation	Content of the meeting	Mutual decision – Plan
10 June	The researcher provided feedback to the teachers acquired from previous collaborative session and from the lesson observations.	Evaluated one case-student <sup>b</sup> 's communication, the teachers felt this student's nonverbal communication had increased (signs and gestures). Summarization and conclusion of the intervention.	A plan for teachers' independent work in Autumn 2020 to enable independent collaboration among the participating teachers.

Note. All teachers were present at every meeting.

<sup>a</sup>Hence the student-participants needed individual instructions based on their communication style, the singular form of teacher vs. students are used, even if there were several teachers and students present in the classroom.

<sup>b</sup>To discern how the lesson design affected the students' learning, the teachers decided to collect evidence on one student's development of communication skills. The selection was based on teachers' mutual decision.

which were slightly differently marked (the amount of words marked in the excerpt differed). Once the teachers' verbal expressions were deductively identified and sorted into each theme related to the research questions, the following analysis step focused on identifying categories in each theme following an inductive process.

### **Interrater Agreement**

The researchers independently coded the teachers' verbal expressions guided by the themes as the research questions indicated, to ensure coding reliability. Each identified part of teachers' verbal talk in one of the themes was identified as an item. Any agreement or disagreement between the researchers was noted for each item. The percent agreement and Cohen's  $k$  were calculated to check the confidence of the agreement. There was 80% agreement between raters as to which category the expressions should be assigned. Cohen's  $k$  calculations indicated moderate agreement (Cohen's  $k = 0.52$ ). Cohen suggested that a value as low as 0.41 might be acceptable, depending on the context in which it is used (McHugh, 2012). To ensure the reliability of the categories used, the researchers collectively examined the excerpts where discrepancies had occurred. If necessary, the authors noted the excerpt based on consensus.

After the crucial categorisation of the excerpts in the transcripts, the final step of Erickson's (2006) whole-to-part procedure was performed, in which each part of the category was analysed in depth to identify patterns in the teachers' thinking. First, the transcripts were analysed to capture the parts of the discussion that related to the three themes: perceptions of student knowledge and abilities, capturing student development changes, and sharing/transferring knowledge of student skills. These analyses were conducted to identify expressions in each theme and further study the expressions' meanings. In this step, the qualitative analysis identified the categories for each topic, and the calculations of the frequency of the theme categories were compared to the total number of words in the session discussions. The excerpts (number of excerpts as well as percentage of total conversation) were analysed to determine if teachers' discussions changed qualitatively and quantitatively between the two occasions (see Tables 5, 6 and 7 for details). To provide an overview of the changes noted in teachers' collaborative development, all words that had been marked and linked to one of the themes in the transcripts were summed, and word frequency calculations were made. The

number of words in each category was calculated and tested for significance using the t-test (SPSS 28.0.1.1). No significant differences were found between the pre- and post-discussion encounters for each theme ( $p = 0.231$ ). However, descriptive statistics indicated differences between themes within the three categories, which were not visible when analysing data at theme levels. The effect size estimation (Cohen's  $d$ ) indicated moderate impact (0.309) at the upper confidence interval (SPSS 28.0.1.1).

## Results

Overall, the pre- and post-intervention calculations showed that video feedback changed the proportion of the themes identified in the transcripts. Before the intervention, teachers most often shared thoughts (third aspect) about students (7.3% of all words expressed). They were least likely to talk about identifying student knowledge (first aspect: 4.53%). After the project, teachers most often talked about identifying student knowledge (first aspect; 10.52%). Teachers' descriptions of students' developmental changes (second aspect) and shared knowledge (third aspect) were less important (5.67% and 5.62%, respectively). This indicates that the overall change in focus on student knowledge changed during the project (Table 4).

### *Teachers' Perception of Students' Knowledge and Abilities*

Within this theme, the qualitative analysis captured six different focus categories in the teachers' expressions: (1) teachers' abilities to identify students' knowledge, (2) students' attention/interest, (3) autistic-specific learning styles, (4) executive functions, (5) students' content knowledge, and (6) students' social and communication skills. In the post-discussion, the teachers' changed focus and discussed their skills for discerning students' knowledge, an increase from 9% to 20% of the total amount of discussion (Table 5). The results also show that teachers talked about student attention/interest to a greater extent, an increase from 22% to 59%. Teachers' perceptions of students' skills were discernible in the discussions during the final meetings:

Excerpt 1

**Teacher C:** What we do know is that he has participated in the activities going on in the classroom for a long time, as in the morning class. He has been there, and participated, but he has participated from below the blanket. He participated in this way during the whole semester.

**Teacher A:** Or behind a curtain, or ...

**Table 4.** Distribution of expressions for each theme.

Themes	Pre-meeting (26 Feb.)		Post-meeting (10 June)		Differences	
	Qty. hits	perc. cover	Qty. hits	perc. cover	Qty. hits	perc. cover
Identifying students' knowledge	14	4.53	16	10.52	+2	+5.99
Experienced changes in students' knowledge	15	6.01	10	5.67	-5	-0.34
Teachers shared knowledge	13	7.30	11	5.62	-2	-1.68

**Table 5.** Theme: Identifying students' knowledge.

Categories identification of students' knowledge	26/2		10/6	
	N	% tot words	N	% tot words
Teachers' skills to identify students' knowledge	2	(62/685 = 0.09) 9%	5	(350/1763 = 0.20) 20%
Students' attention/interest	4	(153/685 = 0.22) 22%	5	(1036/1763 = 0.59) 59%
Autism specific learning style	2	(159/685 = 0.23) 23%	-	(0/1763 = 0) 0%
Executive function	1	(55/685 = 0.08) 8%	-	(0/1763 = 0) 0%
Students' content knowledge	4	(256/685 = 0.37) 37%	4	(117/1763 = 0.07) 7%
Students' social skills	-	(0/685 = 0) 0%	1	(212/1763 = 0.12) 12%
Students' communication	-	(0/685 = 0) 0%	1	(48/1763 = 0.03) 3%
Total	14		16	

**Table 6.** Theme: Expressed changes in students' knowledge and abilities.

Categories identification of students' knowledge	26/2		10/6	
	N	% of tot Excerpt	N	% of tot words
Changes in communication	4	(131/936 = 0.14) 14%	3	(275/970 = 0.28) 28%
Changes in attitude/interest	2	(282/936 = 0.30) 30%	3	(330/970 = 0.34) 34%
Changes in participation	4	(263/936 = 0.28) 28%	1	(123/970 = 0.13) 13%
Changed abilities/skills	5	(290/936 = 0.28) 28%	3	(242/970 = 0.25) 25%
Total	15		10	

**Teacher C:** He is really engaged in what is happening in the classroom. In his absence, he is engaged. Because you can ask him anytime, and he has full control of the visual activity schedule, and he knows what will happen next. If you say, 'XXX [the student's name] can you?' Or so. That's how he's participating. So, we know that. That he has been involved.

In the last project meeting, their explanations of student knowledge development focused less on the students' autism diagnosis, while their comments about specific learning difficulties decreased from 37% to 7% compared with the analysis of the initial project meeting. Their focus on students' social skills increased from 0% to 12%.

Table 5 summarises the teachers' identification of students' knowledge.

### **Teachers' Expressions of Experiencing Student Development Changes**

The second theme captures teachers' expressions of how they perceived changes in students' knowledge development. Within this theme, four categories were found in the inductive analysis: (1) communication, (2) attitude/interest, (3) participation, and (4) skills/abilities. In both pre- and post-discussions, students' changes in attitudes and interest were the categories with the strongest focus (30% and 34%, respectively). The

largest change was found in communication, where teachers talked more about such changes in debriefing (from 14% to 28%). Another discernible shift between the first and the final meeting was that teachers talked less about the changes in student participation during the last meeting (from 28% to 13%).

### Teachers' Shared Knowledge

The third theme concerned the transmission of knowledge of students' skills by teachers, and here there were substantial differences between the meetings. The categories were (1) internal (teacher to teacher) and external (teachers to people outside of the school) sharing of clarifying tools to use for instructions, (2) internal sharing of professional development, (3) internal sharing of student knowledge, and (4) internal sharing of student behaviour. Before the project, the teachers mainly shared knowledge about the tools they used, and this decreased from 60% to 12% (Table 7). The largest increase concerned sharing students' knowledge (from 17% to 55%). An example of the knowledge was the use of a green frame for activity cards in the daily visual activity schedule, as it enhanced students' awareness of which activity card to focus on. The frame was introduced to after-school activities, parents, and other teachers. They also shared their attitudes towards how students should behave in the classroom and how they should be positioned in the classroom. This knowledge was not shared in the first meeting, but it was noted in the analysis of the last meeting. Aspects noted by the teachers were the students' knowledge of objects and their uses, for example, coffee, and its effects on alertness. They also shared their knowledge about how many words the students used and understood, differences in communication skills when students communicated with familiar and unfamiliar people, and how students behaved with other staff and in certain situations.

Finally, the teachers shared their thoughts on the benefits of video recording. They summarised that it had increased the quality of their professional development. Importantly, they obtained new perspectives on what happens in the classroom, as they usually did not have the opportunity or time to reflect on the learning situation. The diversity of children and their movement between school locations made it difficult to get an overview of the educational environment. By noticing and recording, they

**Table 7.** Theme: Teachers' shared knowledge.

Categories of shared knowledge	26/2		10/6	
	N	% of tot Excerpt	N	% of tot Excerpt
External sharing – tools	1	(144/1096 = 0.13) 13%	-	(0/931 = 0) 0%
Internal sharing – tools	5	(662/1096 = 0.60) 60%	1	(109/931 = 0.12) 12%
Internal sharing – professional development	2	(100/1096 = 0.09) 9%	3	(271/931 = 0.29) 29%
Internal sharing – students' knowledge	5	(190/1096 = 0.17) 17%	6	(521/931 = 0.55) 55%
Internal sharing – students' behaviour	-	(0/1096 = 0) 0%	1	(39/931 = 0.04) 4%
Total	13		11	

obtained a better view of how students' situations and knowledge changed over time. They shared this knowledge with each other, instead of just experiencing it individually.

The teachers felt that having a person from outside of the school recording and discussing their work was another benefit:

Excerpt 2 (from the last meeting)

**Teacher C:** No, it doesn't look like school in the eyes of others, but we've actually had a researcher involved in this process, and we have developed our teaching practice. It could easily be considered as trivial, as our teaching is about discernment of small, small things, small signals, which we will highlight in the future. So, we will continue to bring you in [looking at the researcher], to lift our teaching practice.

**Teacher B:** Yes, I think in a similar way, we have to blame [makes a gesture where she makes quotation marks in the air] you sometimes.

The presence of the first author in the classroom for observation made the teachers more comfortable during the collaborative discussions, but it was also a benefit that the researcher was responsible for the video recording and preparation of the meetings. Another aspect that was highly valued by the teachers was the sharing of experiences regarding the students' knowledge and their teaching. They made plans for regular video recording every other week to capture student knowledge and instruction and change. They agreed that the project had contributed to helping them see what happens in the classroom in a new and more detailed way, and they could use this knowledge to develop their students' knowledge. There was consensus between the teachers, and they got to know each other better. Furthermore, they identified difficulties in the school milieu based on evidence rather than attitudes, making it easier to convince school leaders to support and implement changes. One teacher described how they changed focus: 'And if we had not had this project, there is a risk that we would have sat here and whined this afternoon. [...] To be forced into pedagogical discussions is good'. [Table 7](#) shows the themes of the teachers' shared knowledge.

## Discussion

This study examined how video feedback in a collaborative development project improved teachers' perceptions of students with ASD and ID, focusing on their learning needs and ways to improve their active educational participation. The results show how teachers' conversational foci change with a better understanding of what students know, rather than sharing information about the tools used in the classroom. All three of this study's themes include elements of knowledge development: teachers' identification of students' knowledge, teachers' perceptions of students' shared knowledge, and the knowledge that teachers share. The results show that teachers' conversations about students' knowledge increases most. The video supported discussions used were also found to benefit teachers' professional development.

During this collaborative lesson research project, teachers learned explicitly about a theoretical framework, variation theory, by reading Holmqvist's (2004, 2009) textbook on ASD and learning for students with ASD. This may also have made teachers more aware of students' knowledge development. Following Flutter's (2007) assumptions about the positive relationship between teachers' listening to students' voices and

students' learning, video supported feedback can provide active learning, and this method afforded teachers the time to reflect on and examine situations in which they interact with their students, giving them another level of understanding regarding their classroom work.

Following Meadows et al.'s, (2020) recommendation, the researcher provided personalised feedback on the video recordings for each participant, which enhanced the teachers' awareness of how their teaching affected students' learning. This personalised video feedback, enabled the teachers to not only rethink their teaching in general terms, but also to focus on certain learning situations, based on the students' skills, interests, and needs. The teachers' changing foci were driven by the implementation of the variation theory (Holmqvist et al., 2008; Holmqvist, 2011; Pang, 2003) within the collaborative procedure. The teachers' proficiencies in adapting and using strategies based on the children's strengths aligns with the required teaching strategies for learners with ASD and ID (Tanet et al., 2016).

### ***Teachers' Collaborative Development***

The results of Morin et al.'s, (2019) review on video-based research as an approach to improving teacher competencies indicates that video feedback has the greatest impact on young teachers and teachers with short teaching experience. In the present study, there were no control groups. Still, through the thematic analysis (Kiger & Varpio, 2020), differences regarding enhanced proficiency skills emerged. The present study is a case report with few participants, but the results are interesting, as it contributes contradicting information. In Morin et al. (2019), the only statistically significant result about how video analysis enhances teachers' proficiency was its advantages for teachers with comparably short teaching experience. Even if it was not possible to provide statistically significant results in present case report, the findings about enhanced proficiency skills for teachers with long experience in SEND teaching are promising. One reason to the achievement may be that the present research method of video-based feedback was conducted within the context of a lesson study (Lewis et al., 2019) in which the researcher served as the facilitator and researcher throughout the process. The tailored feedback (Meadows et al., 2020) and the fact that teachers had confidence in the research process (as this was a follow-up study, Klefbeck, 2021b) allowed for a milieu of critical reflection (Miller Scarnato, 2018) for teachers that enabled them to develop their instructional strategies, based on their insights into student abilities and needs. Those findings indicate that teacher-researcher collaboration, enabling the teachers' shared focus based on students' needs, in combination with tailored video feedback, can have particular importance in SEND training. Therefore, we suggest that SEND teachers working with students with ASD and co-occurring ID students work with cycles of collaborative lessons regularly (study-plan-teaching-reflection, Lewis et al. 2019). Even if it might not be possible to provide a researcher in each classroom, the present study indicates that working strategically with lesson plans and mutual decisions can benefit SEND teachers to tailor teaching for students with extensive support needs.

## Conclusions and Implications

The present study was inspired by the rights of students with ASD and ID to reach their full educational potential. For children with these disabilities, teachers' understanding, adjustments, and strategies are crucial (Tanet et al., 2016). The present study was designed with Klang et al.'s (2020) recommendation for adding multiple sources of data to capture the educational situation in CSSID. The findings revealed that video recordings can contribute to teachers' perceptions of students' abilities and needs. As Klang et al. (2020) report, this finding is important because teachers in special educational settings are less focused on students' learning compared with colleagues working with similar learning groups in mainstream settings. The present research concludes that multistage teacher-researcher collaboration enhances teachers' awareness of student knowledge and learning. The present study's results are in line with Bentley-Williams et al.'s (2017) findings on the benefits of collaborative alliances between universities, researchers, and teachers to develop understanding and support for students' needs in SEND teaching. Bentley-Williams et al. (2017) emphasises the relationship between pedagogical theory and reflective practice. In the present study, the researchers' guided video feedback enabled the teachers' to not just gain general knowledge about autism and learning (Holmqvist, 2004, 2009), but to implement it in their teaching routines. Consequently, collaborative video supported feedback in combination with pedagogical theory targeting the learner-group didactical needs, enables *responsive practice* (Pramling et al. (2019) in SEND teaching.

## Limitations and Suggestions for Future Research

It is difficult to statistically verify the outcomes in small samples. If the design had included a nontreated control group composed of teacher meetings concurrent with the meetings of our study group, it would have been possible to test the significance between the groups before and after the discussions. Future research should use concurrent classroom groups in similar contexts, in which teachers moderate and lead the process, with the researcher serving as a co-moderator. This method could be more reliable, as collaborative lesson research has been shown to impact professional development in the context of education for students with a combination of ASD and ID, and sustainable systems for implementation should be explored.

## Acknowledgments

This study is part of a research project approved by the Swedish Ethical Review Board (2019-02767). We are grateful to the Swedish Research Council [Vetenskapsrådet] for funding our work under grant number 2017-06039. We also thank the students, teachers, and teacher-assistants who participated in this research.

We extend our thanks to Editage for editing this manuscript.

## Disclosure statement

No potential conflict of interest was reported by the authors.



## Funding

The work was supported by the Vetenskapsrådet [grant no. 2017–06039].

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