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Teachers' descriptions of classroom communication after an SLP-led in-service training

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ABSTRACT

Purpose: The aim of this study is to explore teachers' experience and understanding of classroom communication after participating in a speech-language pathologist (SLP) led in-service training on classroom communication.

Method: This qualitative study used a focus group approach to explore how teachers describe their classroom communication. Twenty primary-school teachers participated. Thematic analysis was used to analyze the teachers' responses about their classroom communication practices 6 months after in-service training.

Results: Three core themes on teachers' understanding of their communication in the classroom were identified in the analysis: (1) awareness of voice use; (2) the use of body communication; (3) setting the stage for learning. The teachers gave many examples of voice use reflecting an increased awareness of audibility and vocal health. They reported on moving around more and using more body communication to enhance their message. Further, they expressed an increased awareness about how body posture affects voice and communication. The third theme reflects how the teachers "sets the stage for learning" i.e. how they use the prerequisites in the physical environment for successful classroom communication, including the classroom's sound environment as well as seating and furniture.

Conclusions: The findings in this study indicate that teachers increased their awareness, implemented new practices in their classroom communication and reflected on prerequisites for classroom communication as a result of the in-service training. Teachers' classroom communication developed when provided practical training and strategies to increase their awareness on communication. We conclude that this type of SLP-led training can be recommended as in-service training.

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Introduction

Communication is fundamental in the learning process. Teacher communication plays a key role to facilitate students' learning and in creating relationships in the classroom [1–3]. Yet, the individual teacher is often left alone in developing and tuning these communication skills. This article reports on how teachers describe their classroom communication after participating in a 5-week SLP-led in-service training.

Classroom communication is described as the face-to-face interactions and communication between the persons in the classroom, which support learning [2]. According to Yusof and Halim [4] classroom communication differs from other interactional activities since the main purpose of classroom communication is, according to the authors, to inform and instruct. According to Hattie [1] the two most important aspects of teachers' support to students' learning are the quality of teachers' practices and the effects these have on students, along with positive teacher-student relationships.

In the present article, classroom communication is defined as the way in which teachers speak and use other aspects of body communication in their interaction with the students in order to support learning activities. The definition is based on previous research from our lab on how children's performance and listening effort are affected by factors such as speech rate [5] and voice quality [6]. It has been shown that children's performance in language comprehension, in general benefits from teachers' slower rather than faster speech rate [5] and also from listening to a typical rather than a dysphonic teacher voice [6]. Listening to a dysphonic voice also seems to increase perceived listening effort, even though test performance is not affected [7–9]. This study presents the statements and reflections of a group of teachers after their partaking in an intervention aimed at increasing teachers' awareness and train aspects of voice and body communication. The content covered aspects such as handling speech rate, speech intelligibility, vocal intensity and voice quality as well as the use of gaze,

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gestures and mimics. Moreover, Leite et al. [10] underline that teacher's learning about interacting with students is a complex phenomenon which must be understood together with personal and structural factors and the intervention in the present study used collaborative learning and feedback on actions. The intervention is further described in Karjalainen et al. [11].

According to Dockrell et al. [12] a classroom may have an optimal physical environment and provide frequent language activities, but if teacher-student interactions are not of sufficiently high quality then the desired language learning will likely not occur. Dockrell and colleagues further, emphasize the need for high-quality, evidence-based practices and techniques to support students' learning [12]. SLPs can usefully bring their expertise to help facilitate students' communication skills in the classroom [13]. Language development, communication and voice use are core competences of SLPs, which could support both students and teachers communication direct in the classroom. There are other studies where SLPs have been involved in interventions with training teachers. Starling et al. [14] describes how secondary school teachers were trained by an SLP in evidence-based techniques for oral and written instructional language. The study focused on changes in teacher practice stemming from the techniques taught by the SLP, but also evaluated the impact on students with language impairment. The results showed a significantly increased use of language modification techniques in the teachers, while their students showed significant improvements in written expression and listening comprehension.

The variations in context affect the teacher's role in terms of both teaching style and the degree of student diversity in a class. The context described in this article will be Sweden, where the majority of students are integrated in regular classes even if in need of special services.

Research in Educational science and school development in Sweden has started to pay attention to the importance of non-verbal behavior in communicative processes in the classroom and to the fact that a great deal of teachers' communication occurs through body communication [15]. In a collaborative research project between University West in Sweden and two elementary schools, the focus was on how leadership in the classroom emerges through communication and relationship [15]. Structure and clarity was expressed as fundamental for leadership, but building relationship with the students, with the purpose of establishing trust and confidence, was seen as a prerequisite to practice leadership. In this sense, leadership was not perceived as automatically "given" due to the teachers' formal role but rather the leadership was created in relation to and in interaction with the students. Non-verbal communication was used as a resource to teach and to manage the classroom. However, the participating teachers had not specifically considered or been aware of the role their non-verbal actions play prior to the study, but saw potential for development. The researchers stated that there is a lot more to explore regarding the significance of non-verbal communication in classroom management, as well as a need for training [15].

Teachers need great knowledge and skills in their profession, and since it would not be possible to fully develop all of these during pre-service teacher education, continuing professional development (CPD) is needed [16]. Besides meeting high demands on classroom communication skills, teachers also need to learn fresh strategies, keep up with new trends, techniques, and methods to meet new classroom challenges, and therefore must learn continuously [17]. However, it is hard to discern in what way communication skills are taught and practiced during teacher education, e.g. the training of voice use has been significantly reduced in most Swedish teacher education programs. To the best of our knowledge, there is no CPD in Sweden on classroom communication skills. Also, there are only a few studies of the effects of CPDs focusing on classroom communication. Zlatić et al. [18] concluded that both student teachers' and teachers' communication competence increased after participating in communication training and teachers' interest in communication training increased. An intervention study by Karjalainen et al. [11] aimed to improve teachers' knowledge and practical skills in classroom communication by delivering in-service training as CPD. The study showed significant improvements in the teachers' vocal health, self-efficacy in managing the classroom and well-being after the intervention. There are different ways to measure the effectiveness of CPD and there is a variation according to whether the teachers or the students have been in focus or both, as in the study by Starling and colleagues [14].

In summary, despite the indisputable importance of teachers' classroom communication skills, teachers have been given little support in developing these skills. Thus, little is known about the impact of training classroom communication skills and how teachers experience their communication. The 20 teachers in this study participated in classroom communication training and significant improvements on vocal health and well-being were found at group level according to a range of questionnaires [11]. However, knowledge is missing about how the teachers participating in this study experience their classroom communication. The overall purpose of this qualitative study is to explore the teachers' experience and understanding of classroom communication after a 5-week SLP led intervention. Focus groups were used to explore whether the teachers described any changes in their teaching practices. To help better understand the results, a short description of the in-service training is given below.

The in-service training as CPD

The in-service training consisted of five modules and was given to 25 primary-school teachers by an SLP (the first author) in group sessions with 4–8 participants during the school year of 2016/2017. The sessions lasted 90 min and were given for five consecutive weeks. The content of the training was partly based on The Communication Supporting Classrooms Observation Tool (CsCOT) where interactions are evidence-based [19]. The five modules aimed to enhance *voice function; speech clarity; strategies*

supporting language, voice ergonomics and raising awareness on room acoustics. The content of the modules is summarized in Appendix A.

Method

Five focus groups were led and moderated by the first author 6 months post in-service training. The teachers were working at seven schools, the focus groups were held at five schools since two of the focus groups included teachers from two schools. There was a range of 2–5 participants in the focus groups and they were held during the spring and fall of 2017. Unfortunately, in the smallest group of teachers ($n=4$) who had undergone the in-service training there were two drop outs from the focus group. One teacher no longer worked at the school and there was no possibility to allocate the three remaining teachers into another focus group, because it was the last one. Therefore, a focus group with three participants was planned. The other teacher unavoidably missed the focus group due to personal circumstances and this information was given to the first author when the focus group was to start. A decision was made to keep the data from the two remaining teachers, since there were several examples of conversations being extended after hearing the descriptions from the other teacher. The focus groups focused on whether the teachers experienced that they had made any changes in their teaching practices related to the in-service training. The teachers were given three questions to discuss: (1) *How do you view your classroom work, now as compared to your work prior to the in-service training?* (2) *Are you doing anything differently now compared with previously that is related to the in-service training?* (3) *How would you compare communication with the students before and after training?* The groups discussed the different questions freely until the subject seemed emptied, that is when no new descriptions or explanations were given. From this material different aspects of classroom communication were later extracted but only data that were of relevance to the aims of this study were included in the analysis. The focus groups lasted between 17 and 33 min and were audio recorded with a digital Zoom Handy Recorder H2 (Zoom Corporation, Tokyo, Japan).

Analytical approach

Thematic analysis was chosen as a method for “identifying, analyzing and reporting patterns (themes) within data” [20,p.3]. The model for thematic analysis described by Braun and Clarke [20] was used. Moreover, the methodological review on thematic analysis by Castleberry and Nolen [21] and their recommendations for conducting a thorough thematic analysis were taken into consideration throughout this paper. Further, an inductive approach was used as this approach allows the identification of themes based on the data and this study focuses on the teachers’ experiences. In inductive analyses, themes are identified during the course of analysis. However, because the focus groups were a follow-up after in-service training with a

specific content known to the first author, it is inevitable that the knowledge of the in-service training content has been present when the themes have been determined. Focus groups were chosen since they enable individual explanations, while allowing for modification and/or expansion after hearing the views of others in the group [22]. There is greater opportunity for the participants to express matters important to them, since the focus group leader leaves some control to the participants [22]. Further, in accordance with the view of Halkier [23] focus groups were chosen with a view to deriving more complex data, rather than investigating the group interactions. Focus groups are useful in getting the actual wordings used by the group for the matters discussed [23].

Procedure

The first author transcribed the focus group conversations verbatim and coded the data using the software program NVivo® (QSR International Pty Ltd. NVivo, Version 12 Plus, 2018). Software programs are commonly used in order to assist with the organization and analysis of large amounts of text and can help to provide an overview of the data and provide a more detailed analysis [21].

The six-phase model described by Braun and Clarke [20] was used as a framework for the analysis and includes the following six phases: (1) Become familiar with the data; (2) Generate initial codes; (3) Search for themes; (4) Review themes; (5) Define themes and (6) Write-up. However, the process was not completely linear and moved back and forth between the phases. When a deeper understanding of the data was achieved it was occasionally relevant to go back and look at earlier analysis with new perspectives. The verbatim transcriptions constituted phase 1. The coding process started after two of the focus group recordings had been transcribed and read through and formed phase 2. The codes were formed from verbatim phrases by the teachers such as “I probably spare my voice too, more than before. Er ... I have taken to clapping my hands rather than standing there and shouting QUIET!” and “Sometimes I think I use my body more than I used to, use bigger movements and gestures. Yes, I sort of show things more”. After the two recordings were coded there were preliminary, yet flexible, themes (phase 3). Phase 4 had started when the following three focus groups were transcribed and coded. During the phases 2–4 the first and last author had regular discussions. When defining and naming the final themes in phase 5 all authors were involved and consensus was achieved. During the final phase write-up all authors were involved in balancing the extracts of data with analytic narratives, and describing and discussing the methods used. The focus group conversations were held in Swedish and therefore transcribed in Swedish. The selected extracts from the themes in the Results section were translated from Swedish to English by a native English speaker.

Participants

The current study included 20 primary-school teachers who had participated in the aforementioned intervention on classroom communication. The 20 teachers (18 F/2M) had a mean age of 42 (27–63) years and their mean teaching experience was 13 (1–26) years. Two of the teachers were uncertified, meaning they had not attended teacher education. The educational system in Sweden is based on a 10-year compulsory school attendance for children between the ages of 6 and 15 years. The most common organizational form (85%) is public schools run by the municipalities and the schools in this study represented this organizational form [24]. The schools reflect a range of socio-economic status areas [24]. The teachers were working in grades 3–6, meaning that their students were 9–12 years old. The median class size in Sweden was 20 students at the time of the study [24] and the median for the classes in this study was 22 students, with class sizes varying between 17 and 37 students. More than half of the teachers were working in classrooms with acoustic panels and the others were to get acoustic panels, since an ongoing refurbishment of classroom acoustics was in progress in the municipality where the teachers worked.

This study is part of the research project approved by the Regional Ethical Review Board in Lund (2016/567). Informed, written consent was obtained from each participant.

Results

The thematic analysis of the focus groups yielded three overarching themes: *awareness of voice use*; *the use of body communication* and *setting the stage for learning*. The overarching theme *awareness of voice use* includes a subtheme: voice ergonomics. Teachers' quotes exemplify how they express an increased awareness through their reflections on actions that are later put into practice. However, the analysis also showed examples of teachers having gained more increased general awareness, without specifying exactly what it related to. Further, there were two teachers who did not experience classroom communication differently after the in-service training. One of them felt that she already had practices that worked for her and therefore did not follow all the advice that was given. Another teacher was not sure if there was a change, since she had thought about how she gave introductions and how to stress what is most important before the in-service training.

Awareness of voice use

The analysis showed that the teachers talked about voice use from different perspectives. The teachers expressed increased awareness about voice use in relation to being heard and a more explicit awareness of the importance of the voice as a working tool.

The in-service training had raised the teachers' awareness of how to use the voice to be heard. This is exemplified in the following statement:

Instead of raising my voice so that those at the back can always hear me, I might 'turn the tables' so to speak and stand at the back so that the others have to turn around – so that I don't end up just standing at the front. (Participant 13, 170421)

The importance of a functioning voice as a working tool to be able to carry out the work of a teacher is described. One teacher states that the voice is very important and a large part of the teaching is dependent on the voice. Further, a loss of voice would make it impossible to continue as a teacher:

But what you think about more, probably, is that the voice is an incredibly good, important instrument. It's mostly that [which] all teaching is based on – that you can speak. Lose your voice and that's it really. If you get so hoarse that you can't speak, you can't do anything here, that's just the way it is. (Participant 4, 170424)

Another teacher, who was not a trained teacher, reflected on the change in using the voice as a working tool:

I'm not so used to speaking actually, I mean I haven't much experience of speaking in front of a class. Relatively new to it you might say. And I've noticed how I use my voice. Before I sort of raised my voice to make myself understood. But now I more sort of emphasize [certain] words instead. (Participant 11, 170421)

This quote clearly shows the change in voice use awareness through the in-service training. Previously the teacher's strategy had been raising the voice in order to be understood, but now the strategy was to stress certain words instead.

After the in-service training some of the teachers talked about an increased awareness not only in themselves but also in their students, either in regard to voice use or to noise levels in the classroom, which is evident in these two remarks:

I think we have become more aware, both I and my students, so we have changed how we use our voices. (Participant 14, 170421)

Now ALL the students in my class know that the ventilation makes a lot of noise. So now they all run and turn it down. (Participant 3, 170424)

There was also an example of where teachers used their own increased awareness to point out something to the students, which one teacher described regarding facing the person you are talking to:

Yeah, another thing is about facing the class when talking to them, not turning away. It's the kind of tip you can give them too, that when they're talking to their classmates they shouldn't turn away. (Participant 20, 171017)

Voice ergonomics

Aspects of less vocal misuse, not raising the voice when reading aloud in class and awareness of posture while speaking highlights as an increased awareness of voice ergonomics, which will be addressed in the following.

On the topic of trying out new ways to avoid putting too much strain on the voice by not raising the voice, but instead trying new ways where the voice is not even used at all is illustrated in the following comment:

I probably spare my voice too, more than before. Er ... I have taken to clapping my hands rather than standing there and shouting QUIET! (Participant 10, 170517)

In another example, a teacher described a new way to avoid straining the voice when getting the students in from recess by using a whistle instead of calling them or shouting:

I whistle the kids in, instead of calling them. Otherwise I used to shout for them to come in, but I've stopped doing that. I have a whistle with me and whistle the students in. (Participant 4, 170424)

Reading aloud is a common task in primary-school teaching. How to do this without having to raise the voice was a question brought up. In one of the focus groups two teachers discussed how one of them had tried lowering her voice to create focus:

I tried this yesterday with the fourth-years. I read more quietly [spoken quietly] so straight away they said 'Can you speak up so we can hear?' No, I shouldn't have to speak louder. So if you put down your pens [and pay attention] I won't have to speak louder. (Participant 20, 171017)

To the experiment, in lowering the voice, the other responded by giving an example of changed voice use when reading aloud:

I have also thought about [not] changing my voice when reading aloud because I noticed before this training that I strained my voice more when I read aloud. But now I try to read [aloud] with a normal voice. (Participant 19, 171017)

One experience regarding voice ergonomics which many of the teachers mentioned was of talking while writing on the whiteboard, or rather the fact that they no longer talked into the whiteboard but instead turned around after writing and then talked.

I feel I think more when I'm at the board, that I hear a little voice 'Turn around, turn around' when I've been writing, so that I speak to the students and not at the board. (Participant 10, 170517)

A teacher reflected on not talking while writing on the board and also talked about the awareness of posture as she referred to an aspect which was discussed during the in-service training. She noted:

Yeah, I notice that with myself, exactly [not talking at the board while writing on it] but I also try to think about my posture and what you were saying about the neck [not twisting the neck or sticking the chin out] and with the voice to reach through and so on. (Participant 19, 171017)

Posture, as well as abdominal breathing, is fundamental to a well-functioning voice. The teachers talked about abdominal breathing and about, prior to the in-service training, not having the knowledge or the practice. The question "Are you doing anything differently now compared to earlier that is related to the in-service

training?" was described by a teacher with: *How you breathe. I didn't know anything about that before.* (Participant 17, 170523)

Another teacher experienced an increased awareness of breathing deeply:

I feel I think a lot about it, quite a lot anyway, now and then about breathing. I practiced quite a lot. That really stuck with me, breathing - I try to breathe deeply. (Participant 1, 170424)

The use of body communication

The teachers gave examples of moving around more in the classroom, when they were teaching. They also gave examples of just standing still in the front of the classroom and being silent and noticing that the class quite quickly became silent and waited for something to happen. As an example of moving around one teacher described how she moved around more in the classroom to fully use the room from different angles:

I move more in the classroom and stop and talk from different angles, not just from the front. I might stand towards the back of the room. Or in the corner or by the window. Yes, I move about much more. (Participant 7, 170517)

The same teacher also gave an example of using more body language than before:

Sometimes I think I use my body more than I used to, use bigger movements and gestures. Yes, I sort of show things more. (Participant 7, 170517)

Another teacher said she had always thought about body language, but even more so now and that body language can sometimes be used instead of spoken words. This is illustrated in her comment about body language where she relates experiences of in-service training to dog training:

To start with I think a lot about body language, but I always have because I'm interested in dogs, they read your body language when you work with them. And I think about it even more now, what I do and can do with my body instead of my voice. Yes, that you can talk without speaking. (Participant 15, 170523)

Articulation was mentioned by a couple of the teachers, as something they have begun thinking about. For instance, one teacher said that she is now aware that she needs to talk more slowly by articulating more deliberately.

Setting the stage for learning

The classroom environment was also discussed. There were certain things that the teachers mentioned which relate to the environment of the classroom. Teachers mentioned aspects of the physical environment and that they thought about the furniture, especially bookshelves. One teacher reported that this was one of the main points of the learning experience from the in-service training:

We have taken that to heart, I thought we learnt a lot from that. The question of how you plan spaces. For example should you use open shelving or not. (Participant 16, 170523)

Another teacher talked about how the current class functioned and how that affected what the teacher brought to attention in the classroom.

Well you think about classes being different. The class I have at the moment are rather rowdy and make a lot of noise. So you have to talk more about how now you are making noise as opposed to now it's study peace. Can you hear how nice it is in here, and I do more ... [I'm] more aware of that. (Participant 4, 170424)

Several of the teachers talked about sound, the fact that they were more aware of the impact of the sound environment after the in-service training and that they were more focused on sounds and noise in the classroom. One teacher reflected that she was now aware of how sounds emerge and how to control them. In her description, she talked about the consequences of too much noise and how her awareness of the environment had changed.

Yes, I would say more focus on sound, things that make noises, all those small things. You think more about where they come from. How they start and it doesn't take much to stop them so they don't get to be too much, you stop it in time so you can keep the noise level down. And it's not just we teachers who suffer from the noise, it's the students too of course. It's their working environment as well as ours. (Participant 13, 170421)

The statement above also highlights the view of the classroom environment as a common workplace, for both teacher and students. Seeing their teaching from the students' perspective is also an important part of teacher development. For example in some of the teachers' descriptions, it was obvious that they were more interested in knowing that the students could hear them wherever they were sitting in the classroom. This can be seen as taking the students' view of audibility. One teacher described it as:

I often ask if I'm here, can you hear across there? I more often choose a student further away to ask. I didn't do that before. I think more about everyone hearing. (Participant 8, 170517)

More than half of the teachers were working in classrooms with acoustic panels. One teacher noted that she was now more attentive to where she placed the students in relation to the acoustic panels:

I feel I think more about where I place the children in relation to these absorbent surfaces. (Participant 3, 170424)

This teacher was working at a school which was first out with the acoustical refurbishment mentioned in the Methods section. However, seemingly it was after the in-service training that she reflected on the placement of the children in relation to the acoustic panels. During the training teachers received information of the negative effects on hearing, if sitting too close to an acoustic panel. This is an example of new knowledge put into practice and how the teachers set the stage for learning.

Discussion

The present study used focus groups to investigate what changes the teachers themselves report in terms of their classroom communication after participating in in-service training. The teachers' described an increased awareness and new strategies for the use of voice and body communication. This increased awareness also emerged in the way they reflected on the classroom environment regarding setting the stage for successful classroom communication.

Teachers experience of their classroom communication

There are two overarching themes in how teachers understand their classroom communication after in-service training, namely awareness of voice use and the use of body communication. The third theme relates to prerequisites for communication, which is expressed in how the teachers discuss setting the stage for learning. The awareness of teachers' voice use is broad and ranges from making themselves heard properly to their use of the voice as a working tool and sharing knowledge with the students. It also includes the subtheme voice ergonomics with some of the basics of healthy voice use, i.e. breathing and posture, and to put less strain on the voice.

A factor which the teachers in this study did not mention explicitly, but which is significant for interaction, is that teachers constantly make adjustments in their voice use and general communication depending on how the students feed their perception of the interaction back to the teacher. However, the significance of this interaction was mentioned by teachers in a study by Leite et al. [10]. The teachers described the importance of being aware of their own verbal and body communication when communicating with the students. They also described the need to analyze the students' interactions and reactions and use this input to adjust their own behavior [10]. Thus, students help teachers get more aware of their voice use. This reciprocity is connected to the concept of Speakers' Comfort, which is defined as "the subjective impression that speakers have when they feel that their vocal message reaches the listener effectively with no or low vocal effort" [25].

The descriptions as for the change of use of body communication were less broad than the description of awareness of voice use and included examples of the teachers moving around more in the classroom, using more gestures and also using their body instead of speaking. The teachers increased awareness, along with classroom practice based on deliberate decisions, are expressed in these two overarching themes of voice use and body communication. We conclude that the teachers experience an increased awareness and put this awareness into deliberate practice in their classroom communication. Previous research on measuring the communication environment in the classroom has shown that teachers are least aware of their language learning interactions, i.e. how adults speak to children [13]. It is plausible that the quality of language learning interactions are of higher quality among the teachers in this study after the in-service training. High quality language learning interactions

are the core of a classroom supportive of communication [12].

The third theme presented in the analysis is setting the stage for learning, which includes aspects of the classroom environment, characteristics of the students (e.g. active and talkative or more quiet), what furniture to choose and placement of students with regard to the room acoustics. These aspects constitute a prerequisite for setting the scene for successful classroom communication. In the words of Jedeskog, the scenography of a classroom is the physical environment for teaching and learning [26]. The results in our study show that after in-service training the teachers show increased awareness and more deliberate choices of classroom practice regarding their use of voice and body communication, as well as reflecting on the physical prerequisites such as room acoustics for successful classroom communication.

Prerequisites for classroom communication

The teachers in the current study reflected on the physical environment of the classroom, although mostly in relation to discussions about the classroom acoustics. We interpret this as the teachers not only using teaching practices, but also the classroom environment to achieve the desired result, i.e. teaching and learning. Similar conclusions have been drawn by Jedeskog [26] from their research in Swedish schools on working methods, furnishing and communication. They found that the most common way of seating was to place the students in rows. Placing the students in rows, facing the front of the classroom, facilitates both oral and written communication and it also helps the teachers to get an overview of the class and notice if students are not keeping up with the lesson [26]. This seating also allows for eye contact with individual students, which has a positive impact on discipline and enhances teachers' interactions with students. However, it hinders interactions between peers [26].

Teacher awareness and change

According to Borg [27] in-service training can strengthen and extend teachers' beliefs; enabling them to be verbalized and put to practice while also promoting links between beliefs and theory. To reflect on and scrutinize your beliefs together with colleagues in teacher training can be an important point of departure for new beliefs and actions. The teachers in the current study reported different changes in their practices, with a few exceptions. Sometimes they talked about 'only' increased awareness. Although an increased awareness does not automatically grant a change in practice, we believe that without awareness of your actions, it will be very difficult to revise them.

It is important to remember that teachers differ in their needs and motivation for change. Therefore, each individual teacher needs to find functional teaching practices in his/her own way. One teacher did not feel that she did anything differently and explained that she already had something that

worked for her. This teacher was one of the most experienced and being content in the practices you have most likely decreases your need and willingness to change. Another aspect that influences the motivation for change was found in the study by Borg [27] were some teachers felt that their beliefs had not changed, for example where they felt that their beliefs and practices were already aligned with those promoted on the course [27]. One of the teachers in the current study was not sure if there was a change in her actions, since she had thought about how she gave introductions and how to stress what is most important before the in-service training. This suggests that she considered her actions already being aligned to those promoted on the course.

There was an uneven distribution as to how much impact the five different modules comprising the in-service training seemed to have made. Strategies for supporting language seemed to have made the least impact, judging from the descriptions in the focus group conversations, while voice function seemed to have made the greatest impact. It is possible, however not very likely, that most of the teachers considered their strategies for supporting language being aligned with the strategies shared in the in-service training while they considered their voice function practice as more remote. A more likely explanation is that the impact mirrors the distribution between the different modules. Strategies supporting language was the module given the least attention during the training. On the opposite, voice function continued through most of the sessions to enable a prolongation of exercises and voice was also incorporated in several of the other modules.

Although the in-service training was rather brief, the presented data suggest that for almost all teachers it resulted in a change in how they describe their communication in the classroom. This result is given support by research evidence of intervention methods facilitating change [28,29]. The in-service training, in which the participants in the present study took part, included teaching methods which research has found to support change, e.g. teachers' observing each other in the classroom, video feedback, group discussions and practical exercises [28,29]. As for the structure of the in-service training, there were elements that have been found to facilitate change. The training program was developed by an external part (B.S. and V. L. Å., both researchers and SLPs) and the instructor (S.K.) took responsibility for the design and training [28] and for a collaborative learning approach [29].

Methodological considerations

The possible weakness of this study is that the first author led the in-service training and focus groups. There is a risk that the teachers wanted to please the first author during the focus groups. However, there were two teachers who reported that they had not changed or were not sure if they had changed anything in their communication in the classroom. This implies that the teachers felt free to speak their mind. A positive aspect of the teachers meeting the same

person is that there was already a relationship established when the focus groups met.

There is a possibility that the first author had a bias stemming from being familiar with the content and implementation of the in-service training. However, measures were taken to minimize this possible bias. The teachers responses were transcribed verbatim and the codes formed from verbatim phrases, hence giving little possibilities for the first authors preunderstanding to affect the teachers' descriptions. The questions for the focus groups, as well as the first steps of analysis were formed in collaboration with the last author. All authors were engaged in the final steps of analysis and interpretations. Another risk is that the teachers, who had put time and effort into the in-service training, wished for a change, which could have affected their replies. However, they gave nuanced descriptions, so this does not seem to be the case here.

Conclusions

This study concludes that, as a result of this SLP-led 5-week in-service training, teachers increased their awareness, implemented new practices in their classroom communication and reflected on prerequisites for high quality classroom communication. Further, we interpret that the teachers used these new practices and staged the classroom as a means to improving their teaching practices, and facilitating their students' learning. One way to enable development of teachers' classroom communication is providing them with opportunity to practical training and strategies to increase their awareness on communication. We recommend this type of SLP-led training as continuous professional development, and it could also be implemented in pre-service teacher education programs. Future research should explore the effect of classroom communication on classroom management. Direct classroom observations by protocols or video-recordings would be very valuable in such studies. It would also be valuable to include the effects on students' academic results and well-being in school.

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Appendix A.

Summarisation of the content of the modules in the in-service training

Module	Content
Voice function	Mini-lecture by SLP on vocal hygiene, voice function and the important role of abdominal breathing and relaxed body for optimal voice use. Reflections on whether the teachers experienced any voice problems and what they wanted to learn about voice. The SLP led voice exercises in the groups. To enable a prolongation of the exercises, this module continued through most of the sessions.
Speech clarity	Mini-lecture by SLP on the impact of non-verbal communication when delivering a message and aspects of speech that affects clarity. Practical exercises with non-verbal communication in pairs and in groups. Some exercises also incorporated voice use. Feed-back was given on video recordings of the teachers regarding their voice use and non-verbal communication.
Strategies supporting language	Mini-lecture on how to support pupils with weak language abilities by the SLP. Presentation of the CsCOT [21], which was used twice between sessions by the teachers to observe each other in their classrooms with emphasis on the interactions taking place. Teachers shared their good practises on teaching methods supporting interaction and language.
Voice ergonomics	Mini-lecture by SLP on aspects affecting voice use, such as noise, air quality, posture and voice demands. Teachers received a protocol [30] to enable them to investigate aspects affecting voice ergonomics in their classrooms.
Raising awareness on room acoustics	Mini-lecture by an acoustician specialized on acoustics in learning environments. The teachers reflected on the sound environments they worked in and this was later a discussion led by the SLP. Advice on how to measure noise with an app and who to contact if the noise levels were high. Also discussions on how to get the pupils aware and involved in decreasing activity noise levels.