Enhancing teachers' relational competence: a teacher lesson study

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Abstract

Purpose – The purpose of this paper is to contribute with innovative knowledge about how lesson study as a method can be used as a tool for increasing in-service teachers' professional development. More specifically, the aim is to test in what way one single lesson study cycle, where teachers' way of perceiving teacher–student interactions was tested before and after, contributes to teachers' increased understanding of relational competence. The study is a pilot preparing for an upcoming main study.

Design/methodology/approach – Participants were 19 lead teachers (swe: förstelärare) in a Swedish municipality. The study was based on a relational framework and methodological approach (Aspelin, 2017; Pianta, 1999). Data obtained through web-questionnaires and collaborative group reflections were analysed and compiled to find general patterns.

Findings – The majority of the participants (98.5%) considered their understanding of relational competence to be increased (Cohen's d 1.72) during the intervention. Additionally, there was a notable increase in participants' abilities to verbalise their understanding post-intervention.

Research limitations/implications – The lack of revised studies might have impacted the validity of this work. However, as this was a pilot study the result can be considered to fulfil the purpose.

Practical implications – The research suggests that lesson study as a method for in-service teachers as participating students can be used effectively to increase teachers' professional development.

Originality/value – The study aims to investigate how lesson study as a method can be used to develop in-service teacher learning.

Keywords Communication, Intervention, In-service teacher training, Lesson study, Relational competence, Teacher–student relationship

Paper type Research paper

Introduction

Nordenbo *et al.* (2008) claim that high-quality teacher competence consists of three subcategories, which are constantly interwoven and interacting with each other to promote student learning. These competences are defined as relational competence, leadership competence and didactic competence. Relational competence, which is the main focus of this study, is a professional approach focussing on teachers' ability to cope and develop interpersonal relationships with their students (Aspelin, 2017). Teachers' relational competence is their ability to initiate, maintain and develop teacher–student relationships

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to promote students' learning. Aspelin (2018) divides the concept into three subcategories: communicative competence, differentiation competence and socio-emotional competence. Communicative competence, the main concern of this study, includes teachers' ways of talking, how this invites participation and shows consideration among students along with the ability to adapt nonverbal communication (e.g. facial expressions, gestures and body position) based on students' behaviour (Aspelin, 2018).

State of the art

Relationships with at least one caring adult are seen as a prerequisite for children's well-being and development (Sabol and Pianta, 2011). Aside from parents, for many children this caring adult is a teacher (Pianta, 1999). A large body of research considers the teacher–student relationship as a factor that crucially affects students' learning (e.g. Murray and Pianta, 2007; Roorda *et al.*, 2011; Wubbels *et al.*, 2012). The teacher–student relationship can therefore be seen as a basic requirement for students' social and academic development (e.g. Birch and Ladd, 1998; Camp, 2011; Graziano *et al.*, 2007; Hattie, 2014; Mantzicopoulos, 2005; McDonald *et al.*, 2013; Murray, 2002; O'Connor *et al.*, 2011; Pianta, 1999; Roorda *et al.*, 2011; Wubbels, 2011). Camp (2011) states that relationships between teachers and students are the foundations on which student's learning occurs. A high-quality relationship can therefore function as protective factor for students at risk, while strained relationships often have the opposite effect.

Teachers' characteristics and ability increase the quality of the relationship and are crucial to promoting student well-being and learning (Sabol and Pianta, 2011). Bateson (1972) claims that everything an individual does (or does not do) constitutes information, which is transmitted and received by individuals in the environment. Thus, every action (or lack of action) conveys information to the recipient that means that bonds can be built, strengthened, weakened or destroyed in every second of contact (Scheff, 1997). Cornelius-White's (2007) meta-analysis points out person-centred and instructional variables that distinguish teachers with positive characteristics. Person-centred abilities are explained in terms of empathy, warmth and high levels of self-awareness, while instructional abilities are considered in terms of teachers' abilities to promote student-oriented activities and higher order thinking. Brophy (1996), aligned with Cornelius–White, states that an attitude of caring and a student-oriented approach is crucial for teachers to develop high-quality teacher–student relationships and promote student learning.

Teachers' feelings of self-confidence correlate with their effectiveness, as self-confidence promotes socialisation skills and good management among students. Teachers that lack a sense of self-confidence tend to become frustrated and give up more easily in troubled relationships with students. According to Wentzel (2012), students' expectations of the teacher–student relationship are characterised by a sense of trust. They value high-quality communication between themselves and the teacher; that is, the presence of positive emotions, closeness and a positive affective tone are important characteristics. Teachers' knowledge of student backgrounds is also a basic requirement. Results from Zagyváné (2017) indicate that from a student viewpoint, desirable teacher abilities are personal attention and efforts to help individual students to develop knowledge.

Nurmi (2012) points out that the majority of research regarding high-quality relationships focus on teacher rather than student characteristics. This is surprising, as building relationships is an interactive process. Nurmi's (2012) meta-analysis revealed that student characteristics have a more significant role in the quality of the relationship than that has previously been suggested. Results from the analysis indicated that teachers experience more conflicts and less closeness in relation to students with high levels of externalising behaviour compared to relations with students without this behaviour. These results are in line with

results from Ewe (2019), Prino *et al.* (2016) and Rogers *et al.* (2015). Cook and Cameron (2010) claim that students with hyperactive and/or externalising behaviour get more negative remarks compared with other students. These results align with student perceptions, as students with externalising behaviour appraise their teachers as being more rejecting towards them compared with how the teachers act towards their peers (Al-Yagon, 2016). McDonald *et al.* (2013) claim that both learning and teaching are fundamentally dependent on the quality of the teacher–student relationship. Research from Rimm-Kaufmann *et al.* (2003) and Skinner and Belmont (1993) support this assertion by claiming that student characteristics may affect the way they are treated by their teacher. Hughes *et al.* (2001) claim that attention must be paid to the quality of the teacher–student relationship.

Teachers' professional development

Although a large amount of Scandinavian research (e.g. Aspelin, 2017; 2014; Aspelin and Jonsson, 2019; Drugli, 2012; Frelin, 2010; Jensen *et al.*, 2015; Juul and Jensen, 2003; Klinge, 2016; Nordenbo *et al.*, 2008) states the importance of relationally competent teachers, this is not explicitly stated in either the Swedish School Act (SFS, 2010:800) or the Curriculum (Skolverket, 2019). Further, teachers' relational competence is not mentioned in the Swedish teacher educator report (Statens offentliga utredningar, 2008:190), even though the phenomenon is described as central, claiming that: "Basically, education is a matter of encounters between people" (p. 215). The default setting can thus be assumed that the teacher–student relationship is a key factor for teachers' professional development and a prerequisite for students' learning. The report also emphasises the importance of teacher education working to develop student teachers' ability to develop trustworthy relationships with their students. Teachers' professional development helps evolve their teacher identity, which according to Williams (2011) is a prerequisite for teachers' ability to educate, interact and negotiate with students.

Teacher identity evolves in interaction with others, which makes professional development in terms of collaborative learning essential. Hattie (2014) and Timperley (2011) both state that professional development is most effective when it occurs in the context of teachers' own practice. One problem with professional development in such contexts is that participating teachers often believe that they are changing their way of teaching while they in fact retaining their traditional patterns (Hiebert and Stigler, 2000). There is often a mismatch between what they think they are doing and what they actually do. Results from Holmqvist (2011), however, demonstrate that an increased theoretical understanding may lead to focus changes as well as pedagogical changes. Another difficulty, according to Holmqvist (2017), is that educational research is complex with many confounding variables that cannot be controlled, making it impossible to draw general conclusions between different settings. Even so, Hieber and Stigler (2000) claim that successful teacher professional development must have a goal that goes beyond the development of individual teachers to generate shareable knowledge. Mantzicopoulos (2005) suggests that interventions that focus on providing teachers with preventive tools to keep conflicts at as low levels as possible are promising. Thus, teachers' understanding of relational competence and how it affects the teacher–student relationship is an important area of research, not only for the field itself, but also for practising teachers; that is, to support their efforts to establish high-quality relationships with students.

Purpose and research questions

There is considerable research regarding the teacher–student relationship. However, most of this work has focused on exploring the impact and implications of high-quality relationships

rather than on how teachers' relational competence could be developed. Research in the field has rarely focused on development of teachers' relational competence to decrease students' feelings of rejection. This study aims to contribute knowledge about how a professional development intervention could enhance in-service teachers' understanding of relational competence. The primary focus is teachers' abilities to observe and describe nonverbal and verbal communication using video-based reflection. The study also aimed to investigate whether design and analysis tools correspond with the purpose of the study.

The purpose of this study was formalised with the following research questions:

(1) How do teachers express their understanding of relational competence, focussing on nonverbal and verbal communication, pre- and post-intervention using video-based reflection?

(2) How do the study design and tools for analysis fulfil the purpose of the study?

Method

Selection and stratified sample

The study was implemented in a Swedish municipality familiar to the researcher based on her involvement in another research project. Twenty-seven lead teachers were invited to participate in the study. The fact that all the participating teachers were employed in the municipality made the selection targeted (Bryman, 2018). The lack of a randomised sample is a weakness of the study as it precludes the possibility of statistically significant results. The risk for selection bias increases when a sample is targeted as it only represents one group instead of representing the whole population (Bryman, 2018; Cohen *et al.*, 2011). However, a targeted sample is a conscious convenience sample motivated by access to possible participants (Cohen *et al.*, 2011) in this case, the researcher's access to the schools in the municipality. Although targeted selection means that selection bias cannot be ruled out, the fact that participants work at different schools and were not previously known by the researcher can be assumed to reduce this risk. The selection was made based on the participants' employment in a municipality rather than their individual characteristics. Nineteen of 27 lead teachers agreed to participate in the study (Table 1).

All informants who participated in the study ($n = 19$) responded to both pre- and post-test, resulting in an internal response rate of 100%, which in turn excludes the risk of internal response bias (Creswell and Creswell, 2015). However, it cannot be ruled out that the initial loss of eight potential participants (31% of the targeted group) may have affected the result.

Data collection

A mixed method approach (Creswell and Creswell, 2015) was used to collect and analyse both qualitative and quantitative data. The quantitative method was used to measure the effect of the intervention. The qualitative method supplemented this by adding participants' personal reflections and experiences as well as collaborative reflections; this provided a deeper understanding of more complex dimensions of teachers' understanding of the phenomenon in focus. Data were primarily collected by pre- and post-test design using web-questionnaires containing both closed-ended (quantitative) and open-ended (qualitative) questions to promote the collection of data responsive to the research questions (Creswell and Creswell, 2015). Ball (2002) claims that watching teaching is a skill that teachers need to learn. Additionally, teachers need to be able to critically analyse and discuss their observations with colleagues. Therefore, in addition to the results of pre- and post-tests, the collaborative analysis during the intervention together with the final evaluation were recorded, transcribed and qualitatively interpreted (Bryman, 2018).

Variable		Frequency	Percent
Participants	Male	3	15.8%
	Female	16	84.2%
Age	26–30	1	5.3%
	31–35	1	5.3%
	36–40	3	15.8%
	41–45	4	21.1%
	46–50	4	21.1%
	51–55	1	5.3%
	56–60	3	15.8%
	61–65	2	10.5%
Undergraduate exam	Preschool teacher	4	21.1%
	Primary, secondary or high school teacher	15	78.9%
Additional exam	Special needs educator	4	21.1%
	Special educational needs coordinator (SENCO)	3	15.8%
Years of teaching experience	6–10	2	10.5%
	11–15	3	15.8%
	16–20	8	42.1%
	21–25	1	5.3%
	<25	5	26.3%
Work placement	Compulsory school	15	78.9%
	Special school[1] for individuals with ID[2] (compulsory)	3	15.8%
	Special high school[3] for individuals with ID (voluntary)	1	5.3%

Note(s): [1] Swe: Grundsärskola, [2] Intellectual Disabilities, [3] Swe: Gymnasiesärskola

Table 1. Demographic information of the sample (n=19)

Research method

The research method used was lesson study. Lesson study is a form of teachers' professional development, originally from Japan (Munthe *et al.*, 2015), that has grown in worldwide popularity (Clevenger *et al.*, 2009). It is a collaborative method where teachers work together to plan, implement and evaluate the effectiveness of a lesson in terms of student learning and behaviour. The lesson is then revised based on findings from the evaluation (Fernandez, 2002). Lesson study research aims to develop knowledge valuable not only for teachers' daily work but also for the overall enhancement of professional communities (Munthe *et al.*, 2015). The present study differs from traditional lesson studies by its focus on instruction for in-service teachers which are to be seen as students in the present study. This focus makes the study innovative as it contributes to developing and investigating whether lesson study as a method can also be used in teacher development instead of only being used by teachers to improve their students' learning. The researcher's teacher team, the group where design and method were discussed along with subsequent reflections and suggestions for revisions, consisted of supervisors and doctoral students which all had an employment as teacher educators at Malmö University or Kristianstad University. In other words, professors and doctoral students served as teachers, while in-service teachers took on the role of students. Another notable difference is that the present study, unlike traditional lesson studies, consists of only one cycle. This is justified by the fact that the study is a pilot study preparing for an upcoming main study.

Procedure and design

The study aimed to investigate if and how in-service teachers' theoretical understanding of relational competence increased during an intervention. The focus was thus not student but teacher learning. As this was a pilot study for a subsequent main study, it only contained one

lesson study circle (Munthe *et al.*, 2015). The discussion section presents suggestions for revisions prior to the forthcoming main study (Figure 1).

Identification, planning and designing

Identification of the learning objective was based on the lack of previous research regarding in-service teachers' relational competence in practice rather than on teacher identified problems. The planning and designing for the intervention were done together with professors and doctoral colleagues at Malmö University and Kristianstad University (Table 2).

Participants' understanding of relational competence in general, and nonverbal and verbal communication in particular, were measured through pre- and post-tests designed as web-questionnaires. Embedded inside both pre- and post-tests was a video-sequence [1] showing an educational situation focussing on teacher–student interaction where one of the students exhibited challenging behaviour. The purpose of the sequence was to highlight the teacher's interaction in relation to different students. The design of the web-questionnaires allowed participants to watch the sequence many times either in its entirety or in parts while answering questions aimed at visualising participants' understanding pre- and post-intervention. The same video-sequence formed the basis for both pre- and post-test. The pre-test contained some initial demographic questions (Table 3), which were replaced by an evaluation question in the post-test. The post-test also contained criteria for analysing relational competence (Aspelin and Jonsson, 2019), which were presented during the

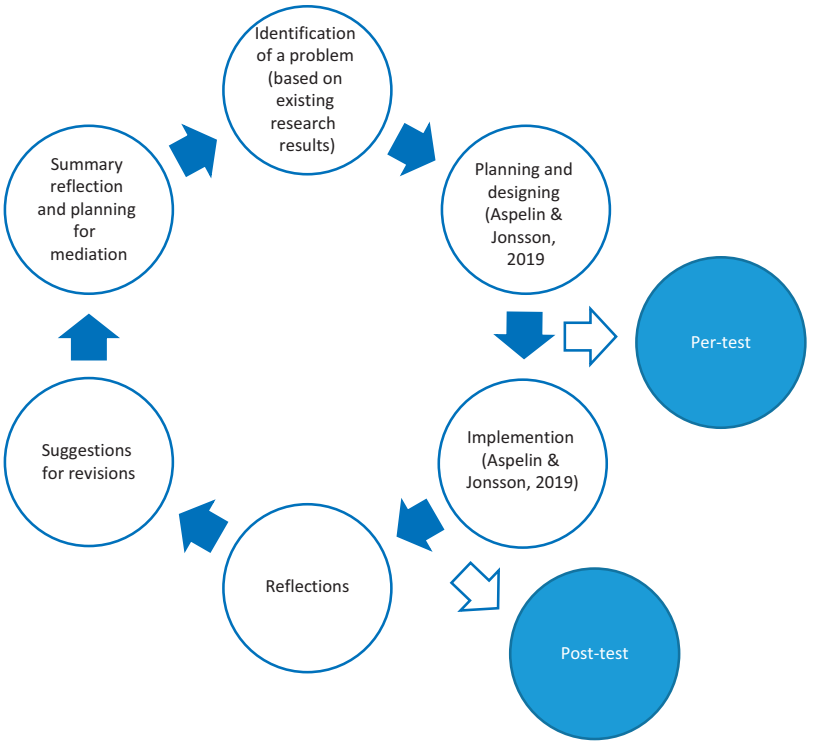

Figure 1.
Flow chart of the design

Date	Lesson study cycle	Activity	Participants	Data
23/1 2019	Identification, planning and designing	Oral discussion	The researcher together with doctoral colleagues at Malmö University and supervising professors at Malmö University and Kristianstad University	Notes
7/2 2019	Implementation	Pre-test	Nineteen lead teachers	Web-questionnaire
7/2 2019		Intervention	Nineteen lead teachers	Taped and transcribed data from collaborative discussions and a final common oral evaluation
7/2 2019		Post-test	Nineteen lead teachers	Web-questionnaire
25/2	Reflections, suggestions for revision and planning for mediation	Oral discussions	The researcher together with a professor at Malmö University	Notes

Table 2. Processing the lesson study cycle

Step	Activity	Method
1	Pre-test	Web-questionnaire (Table 2)
2	Reflections of pre-test	Collaborative discussion among teachers
3	A lecture on relational competence	In real life (performed by the researcher)
4	Presentation of criteria for analysis	In real life (performed by the researcher)
5	Analyse of web-based video-sequence (Precious)	Collaborative discussion among teachers
6	Post-test	Web-questionnaire (Table 2)
7	Evaluation	Collaborative discussion among teachers

Table 3. Outline of pre- and post-test

intervention. Participants were asked to conduct both pre- and post-tests individually using their own computers and headsets.

Implementation

The intervention was carried out during one day. It was planned based on a model designed by Aspelin and Jonsson (2019) containing a lecture about relational competence (performed by the researcher) followed by a presentation of criteria for analysing teachers' relational competence. Together participants watched and analysed an episode (0:26:55–0:31:30 min) from the movie 'Precious' (2009) using given criteria. The main character, Precious, is a 16-year-old girl from New York who has a troubled background of physical and sexual abuse. She cannot read or write and has few friends. The video-sequence shows the interaction between Precious and her teacher, Miss Blue Rain, at Precious's first day at her new school. Participants had been asked to bring a computer and headset for conducting pre- and post-tests individually. Initially, all participants were asked to conduct the pre-test, which was followed by a collaborative discussion. The intervention was then carried out followed by post-tests and a final collaborative evaluation (Table 4).

Reflections and suggestions for revisions and mediation

Data from web-questionnaires and collaborative discussions were collected, systematised and divided into themes to determine units of analysis and interpretation. The results were

Moment	Activity	Method	Pre-test	Post-test
1	Demographic questions ($n = 8$)	Single and multiple choice questions	X	
2	Attitude questions ($n = 3$)	Likert scale	X	
3	Clarification question ($n = 1$)	Multiple choice question	X	
4	Watching an educational situation	A video-sequence embedded in the questionnaire	X	X
5	Criteria for analysing relational competence	Written part		X
6	Assessment questions ($n = 6$)	Likert scale and open-ended alternatives	X	X
7	Attitude questions ($n = 3$)	Likert scale and open-ended alternatives		X
8	Evaluation of the intervention ($n = 1$)	Open-ended alternative		X

Table 4.
Implementation steps of the lesson study

reflected and discussed for conceivable revision and further mediation. This was done together with a professor at Malmö University.

Unit of analysis

Steps taken in the analysis were based on Creswell and Creswell's (2015) recommendation for analysis of mixed method studies. Initially, all results were analysed individually before being integrated for a deeper understanding of the effectiveness of the intervention.

Quantitative analysis

The close-ended assessment questions (five-point Likert scale) linked to the video-sequence, as well as the participants' estimation of their own understanding of relational competence, were analysed using the IBM SPSS statistical software package (version 24). This was done to determine means and standard deviations. The University of Colorado's web calculator (https://www.uccs.edu/lbecker/) was then used to distinguish effect size (Cohen's *d*) between pre- and post-test results within the sample. To ensure a descriptive analysis of the free-text responses *The World Analysis tool in Text Finder* (2007) was used. The program made it possible to identify the number and type of words that the participants used to answer each statement linked to the video-sequence (Figure 2).

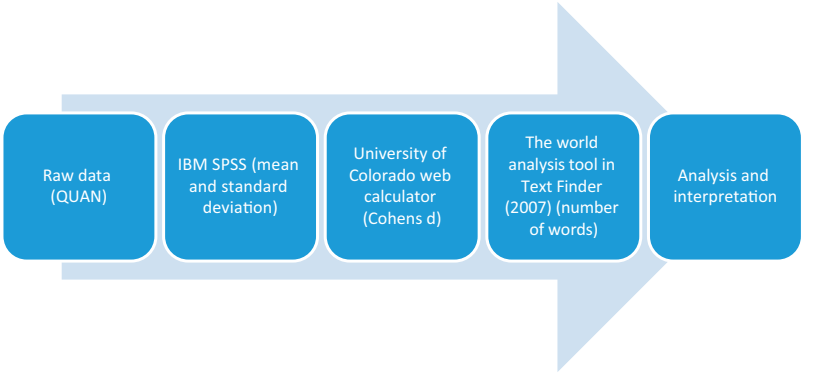

Figure 2.
Quantitative analysis process

Qualitative analysis

Qualitative methods typically produce rich and dense data that need to be reduced and categorised in the analysis process (Creswell and Creswell, 2015). Qualitative data were typed, transcribed and manually aggregated into themes (Figure 3).

Words in each theme were counted using *The World Analysis tool in Text Finder* (2007) before qualitative interpretation. Seven themes were found (Table 5).

Five themes comprised subgroups of communication (meta-communication, nonverbal communication, verbal communication, congruence and incongruence in communication), which were considered relevant to the study. The remaining two themes consisted primarily of either the participants' reflections on the teacher's way of teaching (didactics) or clarifying questions, as well as participants' reflections of their own participation and learning (other).

Ethics

The study followed the ethical standards for humanities/social science (Stafström, 2017). Participants were informed about the purpose of the study together with assurance that the collected data would only be used within research contexts. Participants were informed that their participation was voluntary and given the opportunity to end their participation at any time during the study. All information was given both orally and in writing and the participants gave their written consent to participate in the study.

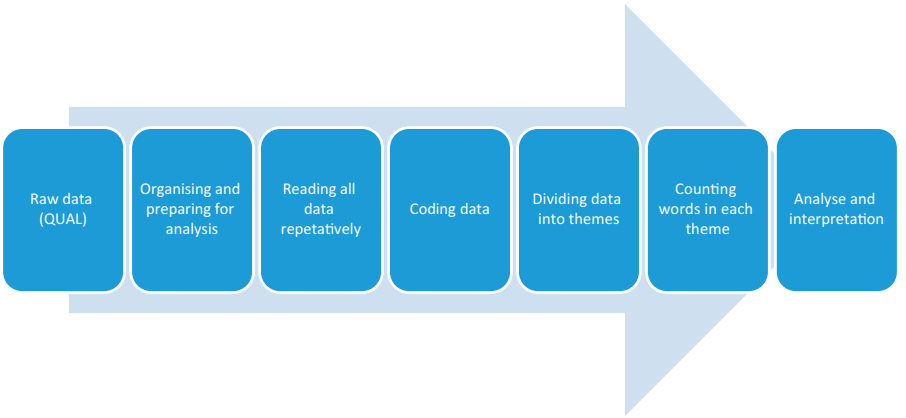

Figure 3.
Qualitative analysis process

Type of words	Number	Percent
Meta-communication	577	34.5%
Nonverbal communication	465	27.8%
Verbal communication	82	4.9%
Congruence in communication	37	2.2%
Incongruence in communication	136	8.1%
Didactics	88	5.3%
Other	287	17.2%
Total	1672	100%

Table 5.
Themes found in collaborative discussions

Results

The participants' perceptions of their own understanding of relational competence were descriptively analysed in IBM SPSS showing a large effect size (Cohen's $d = 1.72$) between pre- and post-test. The results reveal that a majority of the participants (98.5%) considered that the intervention contributed to increasing their understanding of teachers' relational competence. Initially, 26.3% of the participants' strongly agreed with the claim that they had knowledge of relational competence. The same claim had 68.4% of participants agreeing after the intervention, a 42.1% unit increase. Additionally, no participants totally agreed with the claim that they had knowledge of relational competence before the intervention. The same claim received a 21.1% response in the post-test, which made a 21.1% unit increase between pre- and post-tests. Further, 78.9% of the participants considered that the intervention increased their awareness of how their nonverbal communication may affect the relationship with their students. The participants' assessment of the quantitative statement based on the video-sequence only showed a small effect size between pre- and post-test (Table 6).

Descriptive counting of words in the teachers' free-text responses (The Word Analysis tool in Text Finder, 2007) showed that the number of words used increased between pre- and post-tests (Table 7).

Participants' post-test responses contained a greater number of words to describe nonverbal communication, compared with pre-test answers. Further, several participants noticed situations where the nonverbal communication did not match the verbal communication; this phenomenon was also described more in depth in post-tests compared with pre-tests. However, the most notable development appeared in the collaborative analysis of the video-sequence during the intervention; the participants paid more attention to nonverbal communication (e.g. glances, mimics and gestures) in the collaborative analyses compared to both pre- and post-tests. Further, they filled in and complemented each other's thoughts and understanding, which enhanced the collaborative learning. The excerpt below is a significant example of how the collaborative analysis extended the horizon of the common understanding.

Excerpt I

R [2]: If you were to interpret her communication, (student in the video-sequence) what would you say?

P [3]: It hurts.

Table 6.
Effect size for participants' assessment of statements pre- and post-intervention

Statement no	Statement	Effect size within the sample pre- and post-test (Cohens *d*)
1	The teacher has a good ability to make himself understood in the classroom	0.44
2	The teacher responds to the students in a constructive way	0.34
3	The teacher's nonverbal communication (body language, gestures, facial expressions, ways of speaking, etc.) invites students to participate	0.34
4	The teacher is responsive to students' nonverbal communication (body language, gestures, facial expressions, ways of speaking, etc.), which he reads and responds to constructively	0.29
5	The teacher has a good ability to handle his own feelings in relation to the students	0.17
6	The teacher has a good ability to handle students' emotions in the classroom	0.13

Statement no	Statement	No. of words pre intervention	No. of words post-intervention	Increase (percent)
1	The teacher has a good ability to make himself understood in the classroom	205	357	42.6%
2	The teacher responds to the students in a constructive way	350	428	18.2%
3	The teacher's nonverbal communication (body language, gestures, facial expressions, ways of speaking, etc.) invites students to participate	264	409	35.5%
4	The teacher is responsive to students' nonverbal communication (body language, gestures, facial expressions, ways of speaking, etc.) which he reads and responds to constructively	297	393	24.4%
5	The teacher has a good ability to handle his own feelings in relation to the students	292	373	21.7%
6	The teacher has a good ability to handle students' emotions in the classroom	339	354	4.2%

Table 7.
Number of words in teachers' responses in pre- and post-test

R: How do you mean?

P: Her appearance is sad.

R: What does she radiate?

P: Sadness, uncertainty, failure.

R: How is that notable?

P: Her eyes, sad eyes.

P: Her body position.

P: She has no mimicry.

R: Her gaze, where does she direct it?

P: She is looking down.

R: How do you interpret the fact that she is looking down?

P: It does not feel like she thinks that she is worth anything.

R: Is there anything more that some of you want to add?

P: The tone of her voice.

R: What do you think about when you say that?

P: It is very subdued, no shades.

An important characteristic of the collaborative analysis during the intervention was the participants' way of describing nonverbal signals, an ability that was lacking in the pre-test

(see expert II). Furthermore, participants paid attention to how, and in what way, a coherent teacher approach affected the relationship between teachers and students.

Excerpt II

P: I think that her (the teacher's) body language, the nonverbal, and what she says, that it belongs together.

R: Absolutely! How do you notice that?

P: The pitch of her voice, how she pronounces the words, the way she glances, it interacts with one another.

P: She (the teacher) leans her head. It is a small invitation gesture.

The participants appreciated the criteria for analysing teachers' relational competence while putting their knowledge into words.

Excerpt III

P: It gave me words to describe what I saw.

P: It gives so much more when you can put words on and explain what you see . . . It made me see a little bit more.

P: When you sit together and listen to each other (what you see) you also see more yourself. . . it gives so much more when you can put words on and explain what you see.

P: These criteria . . . It became clearer when I should describe (what I saw).

P: It becomes easier to convey the knowledge to others when you can put words on it.

P: I probably estimated about the same (in pre- and post-test), but I had a few other words to describe what I saw (in the post-test).

Analysing the transcribed discussions during the evaluation made it obvious that the collaborative learning created a common conceptual strand: the participants filled in and expanded each other's knowledge, interpretations and understanding of interpersonal communication.

Excerpt IV

P: When you sit together and listen to each other (each other's reflections), you also see more yourself. . .

The overall result suggests that the participants' understanding of relational competence in general, and the importance of communication in particular, increased between pre- and post-test together with their ability to observe and verbalise verbal and nonverbal cues.

Discussion

Using web-questionnaires can be seen as a way of taking advantage of innovative technology to increase accessibility and promote participants' ability to notice nonverbal and verbal signals. Thus, designing pre- and post-test as web-questionnaires is a methodological contribution of the study: the opportunity to watch the video-sequence repeatedly, as a whole or in parts, can be assumed to promote teachers theoretical awareness of relational competence as well as its impact on the teacher–student relationship.

The fact that pre- and post-tests were carried out adjacent to the intervention must be considered a strength as it eliminates external influencing factors. The results indicate that

lesson studies as a method is well suited for teacher development, which can be regarded as a methodological contribution to the field of lesson studies.

The result also indicates that even a little effort can have positive effects. This is an important result, not least based on teachers' often voluminous workload, which prevents them from participating in more time-consuming efforts.

Although the sample was targeted and small, making it necessary to refer only to tendencies, there were some interesting findings. The participants estimated their knowledge of relational competence to be considerably higher in post-test compared with pre-test (Cohen's *d* 1.72). This was surprising, as the intervention was short, and all of the participants had years of teaching experience together with a lead teacher assignment (swe: förstelärarуppdrag), which means that they can be assumed to be skilled teachers. However, a closer interpretation of the web-questionnaires together with the recorded parts of the intervention indicated that the participants had an implicit and partial understanding of relational competence pre-intervention, but the appropriate words and concepts to verbalise it were lacking. The fact that Cohen's *d* only exhibited a small effect between pre- and post-assessments further supports the assumption that participants had implicit understanding pre intervention.

The design of the questions seemed to be inhibitory in the pre-test as the answers were generally more concise compared with the post-test answers. Presumably, this was due to the participants' initial lack of concepts for explicit descriptions of relational competence in general and nonverbal communication in particular. The increased ability to verbalise one's own understanding was also something that the participants pointed out as one of the greatest knowledge gains during the intervention. The pre-test questions will therefore be reworked in the forthcoming full study to promote answers that are more detailed without placing demands on conceptualisation.

Ball (2002) claims that watching teaching is a skill that needs to be learnt to know how to watch and what to listen for. Similarly, as relationships are considered prerequisites for learning to occur, (e.g. Birch and Ladd, 1998; Camp, 2011; Graziano *et al.*, 2007; Hattie, 2014; Pianta, 1999; Roorda *et al.*, 2011; Wubbels, 2011) the ability to observe, interpret and verbalise communicative signals must be seen as basic knowledge for all teachers. This ability is especially important as everything an individual does (or does not do) generates communicative signals to individuals in the surrounding context (Bateson, 1972). Social bonds are built, strengthened, weakened or destroyed in every second of contact (Scheff, 1997). In other words, all human contact implies a constant building, maintaining and repairing of relationships. Thus, projects with the aim of developing teachers' relational competence are important for promoting high-quality relationships and student learning.

Learning to observe, interpret and verbalise teacher–student communication is crucial for all teachers to create optimal learning conditions for students. The participants' reflections were consistent with this while pointing at the collaborative video analysis, based on the criteria during the intervention. This was an important educational event leading to expansion of their horizons of understanding. The result is consistent with research by Munthe *et al.* (2015), Timperley (2011) and Hattie (2014) who point out the impact of collaborative learning on teacher professional development. In both pre- and post-test, the participants focused on video-sequences where the communication was incongruent. While the pre-test answers largely stated the fact, the post-test answers described *how* it was notable. This can be interpreted as an increased ability to verbalise nonverbal communication among the participants.

The most notable development took place during the joint video analysis and demonstrated the strength of collaborative learning. In this part of the study, participants showed an increased ability to interpret nonverbal communication and such aspects of the teacher's relational competence. The participants' way of consistently filling in and completing each other's reflections also contributed to an extended collegial understanding of

how to verbalise congruence between nonverbal and verbal communication. The power of collaborative learning was also pinpointed in the final discussion where the participants underlined collaborative discussions as a crucial factor for their learning. The criteria for analysing relational competence were also highly valued and participants considered those to be helpful when putting their knowledge into words, which is a prerequisite for knowledge to be discussed and disseminated.

Conclusions

Although the result is encouraging, as it indicates an increased theoretical understanding among the participants, we cannot know if this contributes to changes in teachers' interactions in practice. Theoretical understanding and teachers' practice are different questions, and the latter cannot be answered within the framework of this study. The small effect size between pre- and post-test based on the video-sequence indicates that participants had an implicit understanding of relational competence before the intervention. However, the number and type of words used in post-test indicates an increased ability to observe, interpret and verbalise communication in a more sensitive and responsive way. Teachers' ability to verbalise knowledge is a prerequisite for developing a common discourse that enables knowledge dissemination. The result suggests that the study design and method fits well with the purpose of the study. However, the statements in the pre-test must be reworded to promote free writing without requiring conceptual knowledge to find out the participants' initial understanding more rigorously.

Implications for practice

The results of the study can be considered valuable for both teacher trainers and in-service teachers as teachers' relational competence in general and their communicative competence in particular has significant impact on students' well-being and learning. It is therefore reasonable to assume that if teachers' understanding of relational processes increases, so will their ability to promote high-quality teacher–student relationships. The result of the study can be considered to have a special relevance from a special didactic perspective, since teachers' relational competence can be regarded as particularly important in relation to students with difficulties in initiating, maintaining and developing relationships themselves.

Limitations and further research

Participants' increased ability to analyse nonverbal and verbal communication mainly concerns theoretical aspects of relational competence. The question of whether an increased theoretical understanding also contributes to changes in practice goes beyond the design of this study. However, this pilot study will be supplemented by a full study focussing on actual teaching processes, with the aim of understanding both teachers' and students' perceptions of the teacher–student relationship.

Notes

1. A video-film directed by Aspelin and Jonsson (2019) with teacher and students played by actors and extras.
2. Researcher
3. Participants'

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