

# Sources and variation of self-efficacy in cases of student teaching practicum

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The purpose of the study was to determine student teachers' personal self-efficacy beliefs and their views on what type of "sources" were behind self-efficacy in a lesson that they had just undertaken. Very little research-based understanding exists on how student teacher self-efficacy is formed, based on individual teaching situations. In this study, 10 student teachers' interview data associated with the lesson, along with observation data with field notes, were collected. The interviews of four student teachers focusing on the lesson highlighted small (N=2) or somewhat larger (N=2) variations in levels of self-efficacy. Six student teachers had stable self-efficacy (N=6). The findings suggest that, in contrast to the expression of rather stable self-efficacy, a proportion of student teachers had feelings suggesting lower self-efficacy from time to time, although in general their thinking was dominated by average or high teaching efficacy.

**Keywords:** student teachers' self-efficacy; sources of self-efficacy; teaching practicum; teacher education; qualitative research methodology

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## Introduction

Teachers' self-efficacy beliefs are defined as the conceptions that teachers hold about their capabilities to implement their profession. Teachers with a strong self-efficacy usually make use of more effective teaching strategies, are less at risk of burnout, and are more devoted to their profession (see Zee & Koomen, 2016). Empirical research shows that teacher efficacy is a key factor of instructional quality and student support (Holzberger, Philipp, & Kunter, 2013), teacher engagement (Durksen, Klassen, & Daniels, 2017; Granziera & Perera, 2019), job satisfaction (Klassen & Chiu, 2010), and wellbeing (Zee & Koomen, 2016). Teachers' beliefs about their capabilities may also influence what students experience and learn. Teacher self-efficacy has been found to be associated with student-level outcomes such as academic self-efficacy beliefs (Ross, Hogaboam-Gray, & Hannay, 2001) and school engagement (Reyes, Brackett, Rivers, White, & Salovey, 2012). Although not necessarily always strong, significant associations have been found between teachers' self-efficacy and their students' achievement (Caprara, Barbaranelli, Steca, & Malone, 2006; Fauth et al. 2019; Hajovsky, Oyen, Chesnut, & Curtin, 2020; Klassen and Tze 2014; Klassen, Tze, Betts, & Gordon, 2011; Perera, & John, 2020). However, the focus eventually turns to what is behind teacher self-efficacy and what is the role of teacher education, especially in the early stages of a teacher's career.

The study of the sources of teacher self-efficacy (TSE) is based on social cognitive theory (Bandura, 1997). According to this theory, teachers' personal experiences (master experiences), observations of other teachers' activities (vicarious experiences), social persuasion from others, and emotional states (positive and negative) build trust in their own actions, their influence on teaching, and on student learning. These sources do not affect teachers' self-efficacy directly; their effect is instead moderated and mediated by how the individual interprets her/his experiences. However, as Morris, Usher and Chen (2017, p. 798), in their review article about teacher self-efficacy sources, point out, "At the heart of social cognitive theory is the notion of dynamic influence among environmental, behavioral, and personal factors." They continue, "In other words, self-efficacy is not the simple product or sum of one's experiences; the effect of an experience on one's sense of efficacy depends on how a particular event is cognitively processed." The study of teacher self-efficacy has been quantitative, but qualitative research has also increased more recently. Research in this field also involves deficiencies and problems in research methodology—that is, we have challenges in understanding how teacher self-efficacy develops (see Morris et al., 2017). This is where we need a qualitative research methodology specifically. In this study, we are interested in how student teacher self-efficacy develops in the context of teacher education and, in particular, during one lesson within the teaching practicum. Klassen et al. (2011, p. 40) recommend that a focus should be "... a clearer understanding of how efficacy beliefs change over time." They further suggest the need for teacher–researcher collaboration in conducting research: "... would work together to identify critical issues and to develop research questions, resulting in a more finely tuned understanding of how teacher efficacy influences day-to-day classroom practice." (Klassen et al., 2011, p. 40).

The study of teacher self-efficacy in the context of teacher education has increased, especially between 2010 and 2020,<sup>1</sup> and seems to continue to be active. When *practicum*, *self-efficacy*, and *teacher* are used as keywords in the research literature, a collection of sources is quite specific but is not spoken about in a large number of studies. Quantitative, qualitative, and mixed methods are included. Next, we examine from this specific area the empirical studies of student teacher self-efficacy (STSE), which have in common the context of teacher education, but specifically the teaching practicum environment.

### Previous research

Berg and Smith (2018) examined student teachers' self-efficacy beliefs immediately prior to and after the final teaching practicum for an undergraduate 3-year primary education curriculum. Student teachers from New Zealand (N = 75) completed the Teachers' Sense of Efficacy (long form; Tschannen-Moran & Woolfolk Hoy, 2001) and the English version of the Norwegian Teacher Self Efficacy Scale (Skaalvik & Skaalvik, 2007) before and after their final teaching practicum. The results showed that self-efficacy beliefs grew from pre to post; in other words, teaching practice positively affects teachers' self-efficacy. This was a quantitative study in the context of teacher education, but it did not examine the sources of self-efficacy. According to some studies, such as Gurvitch and Metzler (2009), authentic work experiences also offer such challenges that promote the growth of self-efficacy.

Martins, Costa and Onofre (2015) investigated physical education preservice teachers' self-efficacy and their practicum experiences as self-efficacy sources through a mixed-methods approach. Those teachers had the opportunity to benefit from mastery experiences, but guidance and feedback also played an essential role, as mentors' feedback on their teaching process would help them to manage the emotional impact of teaching. According to the results of the study, student-teacher master experiences are considerably essential to the development of teacher efficacy beliefs, but other sources also lend support. Many of the same research findings were also highlighted by Iaochite and Costa Filho (2016) when analyzing 18 reflective portfolios produced by student teachers during their teaching practicum in physical education. During practicum, teachers developed their skills through enactive mastery experiences and contributed to the building of their self-efficacy beliefs related to teaching. The authors conclude, however, that researchers have to consider other sources of self-efficacy establishment and strengthening in addition to enactive mastery experiences. Those sources reinforce enactive mastery experiences and exert important effects that enable teachers to establish and reinforce their personal beliefs concerning teaching.

A study by Pfitzner-Eden (2016) also highlights the importance of mastery experiences. With respect to Bandura's (1997) social cognitive theory of the sources, this does not denote that no meaning is derived from verbal persuasion, vicarious experiences, and the physiological and affective states' influence on teacher self-efficacy, but rather that those sources' effects on the self-efficacy of preservice teachers could be wholly mediated by mastery experiences. In a study by Palmer (2011), 12 teachers participated in an intervention that was designed to offer them cognitive mastery, enactive mastery, modeling, and verbal

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<sup>1</sup> In the years 1980–1989, 1 record; 1990–1999, 8 records; 2000–2009, 16 records; and 2010–2019, 79 records in ERIC database as keywords practicum, self-efficacy, and teacher were used. (13.4.2021)

persuasion. Based on the results, development of self-efficacy beliefs was mainly due to cognitive mastery and in situ feedback.

Chen (2019) analyzed the relationship between preservice teachers' efficacy, emotion, and practicum performance score. A data set of 963 teachers was approached from four universities in China. As expected, the results generally show that self-efficacy beliefs significantly predict student teachers' practicum performance through their emotions. Teachers with a higher level of efficacy on instructional strategies positively predict their practicum performance through more positive emotions. Admittedly, in this study, emotions were not studied as sources of the teacher's self-efficacy. Rather, this is a quantitative study, so it does not analyze the research phenomena on a situational basis.

Klassen and Durksen (2014) examined the development of self-efficacy in relation to the work stress of preservice teachers during a teaching practicum. They used a longitudinal, intraindividual, mixed-methods research design to analyze the developmental trajectories of 150 student teachers. The critical influence of verbal persuasion as a source of self-efficacy was emphasized by informants' frequent mentions of the positive and negative influences exerted by mentor teachers. In addition to verbal persuasion, it seems that mentor teachers also affect self-efficacy beliefs by offering a model of successful teaching and influencing the chances of successful experiences. In a study by Black (2015), 22 teacher candidates recorded their challenges and thinking processes during the last 6 weeks of their teaching practicum. Student teachers completed a summative reflection in which they noted changes in themselves and described when or if they felt self-assured as teachers. According to the findings, the following themes appeared as either the challenge or condition for their self-efficacy beliefs: effective classroom management, successful curriculum planning and implementation, positive rapport with students, and supervising teacher approval.

The idea of variability has already been under preliminary examination in a few studies—such as Black's (2015) research and Klassen and Durksen's longitudinal study (2014)—but Rupp and Becker's (2021) work actually focuses on it. The latter examined situational fluctuations in the development of 120 student teachers' self-efficacy beliefs during a 3-week teaching practicum in Switzerland. Situational measurements (i.e., states) were assessed during a 6-lesson teaching unit. Results showed that student teachers' intraindividual-state self-efficacy had grown during the teaching practicum. This fluctuation was predicted by mastery experiences and cooperating teachers' discourse contents in lesson conferences. Based on their findings, the researchers state the following:

As a consequence, these findings indicate that it is not sufficient to only look at linear developmental trends over the course of the teaching practicum. Since the teaching practicum is a crucial developmental phase for student teachers, it is therefore essential to consider situation-specific fluctuations, as it allows identifying situation-specific sources that can explain state STSE estimates. (p. 8)

Even in that study, the development of teacher self-efficacy was not qualitatively and situationally analyzed within the lesson or through using video data, although certainly the study was oriented toward “microprocesses.” The researchers wanted to use a quantitative research methodology and analyze changes at the lesson level, that is, the follow-up they formed. For example, the measurement instrument used the following item: “In this German lesson, I was satisfied with my own performance” (Rupp & Becker, 2021, p. 4). In other

words, this study assumes that there is a certain stability in the teacher's self-efficacy over the course of the lesson.

### **In summary**

Some of the studies are placed in the context of teacher education and are divided into both quantitative and qualitative studies. However, there are a few empirical studies that have qualitatively examined self-efficacies' development and the sources associated with it during the teaching practicum. According to the empirical findings, several sources (according to social cognitive theory as well) are crucial, but the main importance lies with master experiences. The so-called mediative importance also rests on the feedback and the model of mentor teachers, especially if they are experienced. The teaching practicum context has less often studied emotional experience and its importance toward the development of self-efficacy using qualitative methodology.

However, quite recently there have been calls for studies that would (a) more reliably gain an overall understanding of teachers' self-efficacy and its mechanisms, as well as the sources involved. This means, in qualitative research methodology, striving for the use of more and different types of data as well. In this case, we will pay attention as to whether the various data substantiate a consistent overall interpretation of teacher self-efficacy and factors influencing it. On the other hand, there is also a transition to (b) research designs that seek to focus the mechanism of self-efficacy in time, as a particular process. As the best and newest example of research consistent with such a trend, we can consider Rupp and Becker (2021), a study focusing on possible fluctuation from a series formed by a few lessons. That study shows that there exist variability and changes "inside" of the teacher during teacher education, and especially during the teaching practicum. On the other hand, in that study, a single lesson is assumed to be stable. This premise, which assumes that there may be changes, inspired the current study to ask if changes may potentially occur even during one lesson. The preceding developments that were related to earlier research, but also to the shortcomings associated with it, led to our research problem: *Is there a variation in the teacher's self-efficacy and its sources when a single lesson is considered as a reference point?*

At the same time, we are exploring the *congruence between teachers' thinking and activity in terms of self-efficacy*. The question is whether we can rely on the teacher's interview report about beliefs in her/his capability. We are interested in whether, for example, a management problem observed in the video data, is related to what the teacher is talking about in interview data. Possible congruence reinforces the interpretation of the level of self-efficacy and its variation in the lesson. By systematically comparing teachers' lessons, we aim to show whether a lesson has considerable, little, or no variation in the level of self-efficacy (Table 1). Although self-efficacy is sense and belief, it gets the essential material of events and situations from the lesson. Research methodological design that favors triangulation plays a significant role in the study of this phenomenon.

## Study implementation and methodology

The sample in the study consists of 10 student teachers enrolled in a program to complete a master's level university degree and achieve a class teacher qualification at the University of Eastern Finland.<sup>2</sup> The teaching practicum for students in this research context was at the beginning of their curriculum (six informants) or toward the end of the curriculum, that is, 3rd- or 4th-year student teachers (four informants). Randomly placed student teachers practiced in one classroom under the guidance of the mentoring-class lecturer at the Teacher Training School, and they volunteered to join the study. First-year students normally have five practice lessons and 3rd- to 4th-year students 14 lessons, among other activities, according to the practicum program (e.g., advance task, individual and group guidance, observation, report). Some students had work experience in the field of education before and during teacher training.

A written information paper was prepared to describe the study, which informants reviewed verbally, and they also had the opportunity to ask related questions. Participants were entitled to withdraw from the study if they so desired. The research permits were obtained from the department director and student teachers filled out the consent forms. They were assured that the data and their identity would be dealt with in absolute confidence. In addition to key research findings, Table 1 provides information on interviewees' work experience as teachers and the stage of their studies in teacher education.

### Acquisition of research data

*Student teacher interview.* The interview instrument was drawn up theoretically so that it was divided into four subareas, or source areas, according to Bandura's (1997) social cognitive theory. From each source area, two to four main questions were developed. The interviewer could also ask specific questions if the situation required an answer. Questions were also established to assess teacher self-efficacy in its three areas<sup>3</sup>—teaching methods (e.g., *What is your perception of the success of teaching?*), management (e.g., *If you notice any disturbances in the lesson, what were they like and how did you solve them?*), and learner engagement (e.g., *How do you motivate students who are not interested in the subject being taught?*)—and to collect background information (teaching experience and stage of study in teacher training). In total, the interview instrument contained 18 main questions. The interviews were recorded, resulting in the transcription of several pages. The observation data comprised detailed notes from the researcher on 10 lessons (one lesson per student teacher).

*Classroom observation.* Researcher (Teacher Training School lecturer) produced the observation data. He was seated at the back of the class and recorded notes on the computer with a word processor; at the beginning of the lesson, he logged the time, subject, and the student teacher's pseudonym. Based on his observations, the observer took detailed notes chronologically from the beginning to end of the lesson, step by step, describing the activities of the teacher and pupils. In practice, therefore, it was a matter of logging observations simultaneously during lesson events. The goal was an accurate description of the progress of the

<sup>2</sup> The study uses pseudonyms in the interview phase and later also in the presentation of research results.

<sup>3</sup> See e.g., Tschannen-Moran and Woolfolk Hoy (2001). The three-part structure is quite commonly used in quantitative research.

lesson. The point was to use the lesson as a context for self-efficacy reflections, comparing the primary interview data to interpret supportive observation descriptions.

Writing step-by-step lesson notes simultaneously during lesson events was an intensive, natural, and flexible mode of data collection. Of course, in similar settings, some notes have always filtered through interpretations and observations, but there was a priori an attempt to describe lesson events based on concrete events and teacher–pupil activities in classroom situations, as well as an attempt to use typical expressions when talking about teaching.

### **Validation strategies and data analysis process**

Creswell and Poth (2018, pp. 259–263) describe nine different validation strategies based on the research methodological literature. They recommend that researchers use at least two of them. The strategies can be distinguished by which of three groups each reflects: researcher, participant, or reader or reviewer. We use three of the strategies in this study, namely (a) corroborating evidence through triangulation of multiple data sources, (b) the second contributor prolonging engagement and persistent observation in the field, and (c) generating a rich, thick description.

The first of these is clear because we take advantage of lesson observations and interviews that connect to the lesson carried out by the same student teacher. The second strategy is not that the research data on observation are long-term but that another researcher in our study *is doing, as a supervising teacher, work that contributes to the creation of relevant interpretations of raw data, that is, observations in the class*. Indeed, one can talk about the fact that the second researcher knows the context of this study, namely, the conditions of teaching and classroom practices in the teaching practicum. The third strategy of validity can be justified by the fact that both types of data (observation and interviewing) have been carefully transcribed and only then launched into the details of a predominantly theory-driven qualitative analysis.

A thematic analysis, developed by Braun and Clarke (2006), was applied to the data. An article by Maguire and Delahunt (2017) explaining the application of the analysis model was additionally utilized. That model of analysis is well suited to a wide range of qualitative research and is not limited to just one specific theoretical–methodological approach. Here, we used theory-driven analysis; in other words, we embedded themes, that is, the sources of teacher self-efficacy, into interview questions. Observation data plays an auxiliary role in our research. We have not coded the subject matter of the lesson, but instead we focus on the progress of the lesson as a *teaching method*, as *classroom management*, and as *learner engagement*. In particular, we pay attention to whether there are any “interruptions” in the lesson or problems that the teacher student could potentially address during the interview.

Case (pseudonym)	Else (woman)	Oona (woman)	Juuso (man)	Jade (woman)	Teijo (man)	Elle (woman)	Helka (woman)	Jarkko (man)	Eveliina (woman)	Henni (woman)
<i>Previous teaching experience</i>	Very minimal	Very minimal	1 month	1 year	2-3 years	Very minimal	1 year	1 year	2 years	None
<i>Year of study in teacher education</i>	3rd	3 <sup>rd</sup>	4th	1st	3rd	3rd	1st	1st	1st	1st
<i>Level of self-efficacy</i>	Average	Average	Relatively high	Relatively high	Relatively high	Low	Average	Relatively high	Relatively high	Average
<i>Congruence of interview data and observation data</i>	In congruence; the teaching student felt anxious if peaceful working conditions were impaired. This also manifested itself on the basis of observation data.	In congruence; toward the end of the lesson, success occurs, sources raise self-efficacy.	In congruence; both data sources support the same conclusion about the level of self-efficacy.	Pretty clear congruence; she knew how to analyze the flaws in the lesson (which came to light in the observation data).	Conclusions lie in congruence (sources, self-efficacy, and execution of instruction).	Seeking causal attributes; contradictory, not clear congruence.	In congruence; she is able to analyze why there are behavioral problems in class from time to time (reflecting on causal attributes is relevant).	Clear congruence; both data sources support the same conclusion about the level of self-efficacy.	Clear congruence; both data sources support the same conclusion about the level of self-efficacy.	Not clear congruence, as there are constant disturbances in peaceful working conditions, but student teacher also showed satisfaction in her self-efficacy.
<i>Level of fluctuation in the lesson</i>	There is variation: At the beginning there was an experience of failure, then self-efficacy soars.	There is variation: problems in the teacher-led phase; as the teaching method changes, self-efficacy improves.	Very slight variation, but there were highlights at various points in the lesson.	Minor variation, as there were problems at the beginning of the lesson, but the lesson was perceived as successful on the whole.	No variation.	No variation.	No variation.	No variation.	No variation.	No variation.

Table 1. Teacher cases, background information, and self-efficacy and its level of variation in the lesson

## Research findings

Three types of cases can be identified from the data: teachers without variation ( $n=6$ ), teachers with very minor variation ( $n=2$ ), and teachers with some variation ( $n=2$ ) (Table 1). The table contains condensed findings for each of the 10 cases. The first two lines provide background information on the subjects. The interpretation of the level of teacher's self-efficacy is based on the researchers' overall interpretation of the teacher's self-efficacy in its three components and the teaching observation data. We also describe the congruence of these two data sets in each case. The main findings of our study are described in the bottom row of the table (i.e., we have classified teachers into three levels according to the intensity of variation).

The results are verified and deepened on the basis of thematic analysis as follows, with *one example—a case—of each type*. This description and analysis are based on observation data, as well as interview data and their citations. Based on analysis, the pseudonyms Oona and Else are teachers with variations in self-efficacy and related lesson experiences; Juuso and Jade are teachers with little or very little variation in the experience of self-efficacy; and other teachers, namely Teijo, Elle, Helka, Jarkko, Eveliina, and Henni, are teachers whom, based on analysis, do not vary in experience of self-efficacy during the lessons and interviews. A key objective of this study is to understand the construction of self-efficacy in a very microscopic way within the research data. However, we are not concluding that teachers in our data behave consistently in any single way, for example, that some teachers always have variation in their self-efficacy and some never have it.



## **Variations in self-efficacy and related lesson experiences: Case description, Else**

### *Lesson observation*

Else has limited teaching experience, and she is a 3rd-year student teacher. Else's lesson was for fourth-grade pupils on mathematics, specifically division. The subject began in a participatory way, with using pupils themselves as an illustration by grouping them and then asking them to move to groups of different sizes according to the operation of division. Observation data show that she interrupted this activity because it had failed the way she had designed it. Thereafter, teaching continued, using questioning as the teaching method, and pupils engaged well at that stage.

The lesson also had related exercises, and during these, the teacher was circling the class. In between, she arranged for pupils to take a break, which brought recreation and variation to the teaching. She also gave instructions on tasks. In between, the tempo of teaching was fast. This was embodied by the fact that when she asked students questions, only a few students were engaged in the lesson.

### *Interview*

From the teacher's perspective, the interview data underscores that the illustrative activity of pupils moving around and learning division operations was not successful, according to her comments about the beginning of the lesson

Well, the pupils did not listen to the rules properly and there was extra noise, and they didn't [know] what they had to do. They didn't concentrate on calculations and chatted [about] something else.

However, her interview shows that otherwise the pupils were involved when the teaching method had changed later. Before the lesson, she had received teaching ideas from other student teachers, and she also considered the comments of her supervising teacher important. In general, the teacher's interview embodies pupil-centered thinking. She still attaches importance to the comments of other student teachers as well, but not entirely uncritically, as she says they must be "filtered." Based on interview data, she brought up that she experienced feelings of pleasure and success. On the other hand, she also mentioned a sense of anxiety in a portion of the teaching.

I felt some anxiety when I had classroom management problems.

In fact, this relative strain came up based on the observation data, and in the interview, she also highlighted the "hassle" among pupils, which she perceived as problematic. However, overall the teacher felt the pupils' commitment to this lesson was good. She pointed out that good concentration was observed in the latter lesson phase (doing math-book tasks on the subject taught) and that the pupils were in general working well.

Pupils worked quite well during the independent math-book tasks. There were also others along supporting me, for example, the special teacher, the classroom instructor, and the supervising teacher.

One other student teacher, Oona, also had variations in self-efficacy in lesson situations. Her self-efficacy seemed to increase when the method of teaching changed (see Table 1). Else's self-efficacy is average or higher, based on the overall estimation, but it is elevated toward the end of the lesson. Both interview and observation data are in congruence. The teacher experienced anxiety when she had challenges in classroom management; these challenges and the fact that she was concerned about them appear in the observation data. There is variation in the teacher's self-efficacy based on our data, as the teacher experienced a failure at the beginning of the lesson, causing her to interrupt the action. She was arguing the decision in such a way that it presented as obviously meaningful. However, an overall examination of the lesson and interview leads to the interpretation that self-efficacy had arisen later, and in the context of the rest of the lesson, she had high self-efficacy moments.

### **Minor variations in self-efficacy and related lesson experiences: Case description, Juuso**

#### *Lesson observation*

Juuso has little teacher work experience outside of teacher training, only about 1 month. He is a 4th-year student teacher who is now for the first time in the teaching practicum. He is a subject teacher student in the university, but is now studying to also become a class teacher. Thus, this practicum belonged to his personal pedagogical studies. A lesson in mathematics taught by Juuso (fourth grade, subject of mental calculation and operation of addition) began with mental calculation tasks with the whole class. Juuso used a documentary camera as visual support to his teaching to show pupils tasks and to explain instructions. When the teacher switched to math-book tasks, the noise level in the classroom rose.

Math tasks were conducted on a teacher-led basis. In between, the teacher explained additional theory, utilizing a documentary camera as visual support. Examples were discussed together with pupils and there was little noise in between. The lesson was comparatively stable, but the highlights broke it "upward." This usually manifested itself in such a way that the pupils were more intensively engaged in the lesson.

#### *Interview*

In the interview, Juuso talks about his planning and his own teaching materials ("material bank"). Being challenged produces pleasure for the teacher, he says.

I think the lesson started well with my own math examples and wider explanations. Some pupils were particularly interested in them.

He has ideas of his own about how to develop a lesson; for example, in observing other teachers, he has paid attention to how to talk to pupils.

I should have planned better and trained teaching beforehand—how I would explain the subject clearer. I could have prepared drawings and examples beforehand about the decimal system. If they had been ready, I could have spared a couple of minutes.

He values the supervising teacher, but he did not want to take a cue from other peer teachers, and he has also not taken a model for this lesson among peer teachers. According to what he reported, he observed the pupils and talked about the importance of pupils' nonverbal feedback to the teacher. In the interview, the teacher explains that he has received positive

feedback from the supervising teacher about the plan of the lesson, but also spontaneously about the implementation of the instruction.

The supervising teacher praised me for our feedback, which was a feedback opportunity based on my hour plan. After the lesson now, there was a quick compliment to it verbally. Positive performance and positive comments, and it becomes a positive mind.

During the lesson, he did not experience a sense of stress. He experienced real pleasure when he raised some more challenging content in teaching, and he noticed an increase in student interest.

I think that when you show things a little bit harder to do, pupils can become more interested in the subject; I like that absolutely.

On the other hand, he recognized that in the lesson there may also be a low level of anxiety. However, based on the interview, self-efficacy focused on the lesson was good or high in all aspects. He was satisfied with his teaching methods. Group management was good, and learner engagement was good. It is clear from the interview with the teacher that he is accustomed to analyzing and reflecting on his teaching.

The other student teacher, Jade, is also typed as belonging to the category of “minor” variation. She had some problems at the beginning of her lesson, but she found the lesson successful in general.

It can be concluded that Juuso had a high level of self-efficacy. This conclusion is supported by the clear congruence of the observation and interview. There is only a very slight variation in the quality of the lesson; Juuso succeeded in many points of the lesson, resulting in an improvement in student engagement. The teacher also talked about the use of his own “material bank.” He is willing to bring challenges to teaching, and he enjoys such moments with students. The conclusion about “only minor variations” in self-efficacy is based on data; there is not one single process or moment when a teacher would be annoyed to experience lower self-efficacy. Rather, it is a case of varying levels of activity and engagement among learners, and the teacher had also tried to challenge pupils above basic level. This produces variation in the teacher’s self-efficacy, but that variation does not lead to teacher annoyance; rather, it is reflected in the level of student engagement. However, the teacher is interested in developing lessons. Because of the challenges offered to pupils, he got enjoyment for himself. Thus, one can state that the lesson fluctuates, but it varies between what the teacher considers a “basic level” and moments of higher challenges. The lesson does not, at least from the perspective of the teacher’s own reflection and interpretation, include a moment of failure. On the other hand, the teacher’s interpretations of his own teaching are not entirely stable, because there are variations of self-efficacy between basic- and higher-challenge teaching levels.

### **No fluctuation in self-efficacy and related lesson experiences: Case description, Teijo**

#### *Lesson observation*

Teijo is a 3rd-year student teacher with 2–3 years’ teaching experience before teacher education. The lesson description here is fourth-grade math, and the subject is multiplication. In

this math lesson there was a lot of active work for pupils. In between, there were minor problems in classroom management, but otherwise the teaching proceeded with the pupils working on tasks, and the teacher was individually directing the pupils' work. Independent work was interrupted sometimes, where the teacher had brief teaching moments and then he guided pupil work.

Thus, the methods of teaching in the overall picture vary, but none of the different situations are highlighted or raised during the lesson. The teacher's instruction looked confident, and there were no essential variations. His teaching can be characterized as executed with positive self-efficacy, and the teacher managed to organize the activities of the class well—perhaps in between, it was possible to see some classroom management challenges and some reactions to them in the teacher's action, talk, and body language.

### *Interview*

Based on the interview data, it can be noted that all four sources of social cognitive theory have been influential in the shape of the lesson.

My teaching is in a continuous developmental process, all discussions are the best, that you teach and somebody else teaches and then we discuss what was good and what could be done in a separate way. You can compare opinions and you can then bring something to your own teaching, how to organize or motivate certain pupils.

The teacher did not feel stress and did not have any other negative emotions. He was satisfied with his lesson.

We had multiplication as subject, there were some routines pupils had to remember. There was a possibility of mess, but it went well. And classroom management in general and atmosphere were exceptionally good today. Pupils worked independently and supported each other by giving "work peace." It was nice to see that.

There is a positive and student-centered style in teaching. He is interested in the motivation and study of pupils and in learning about them. Although he was satisfied with his teaching, he also saw topics for development (e.g., better organization of teaching). The teacher's beliefs about the level of self-efficacy came out very clearly. He identified the critical points of his lesson. Such a reflective situation would be, for example, when he had chosen to play a game as a teaching method (which motivated pupils a lot), and then he directed pupils to the next phase of the lesson and another activity. However, based on the interview, the self-efficacy during the lesson was quite stable, based on the teacher's beliefs and emotional description. The teacher's self-efficacy can also be explained by his long-term teaching experience before going into his teacher education program (according to earlier research, teaching experience potentially builds a certain level of stability and confidence in one's abilities as a teacher). In summary, the observation and interview data provide a very credible understanding of this teacher and his stable self-efficacy.

All went well during this lesson, everybody understood what and why we should do. Pupils worked well and gave to others "working peace." It was a nice lesson to be teacher in this lesson.

Based on the data, Teijo has a high self-efficacy. This can be further elaborated on and confirmed by the conclusion of his finding sources of self-efficacy. The perception of self-efficacy and the execution of teaching in the lesson under study are in congruence. They support each other harmoniously.

## Discussion

The focus of the study was on whether there is variation in teacher self-efficacy within the lesson. The experience of self-efficacy of the student teacher varies rather slightly over the course of one lesson. Based on this data, for six student teachers, it doesn't seem to vary at all. On the other hand, the data revealed four teachers having thoughts that suggest unexpected change, disappointment, or failure. Often, that failure has come out somehow—in addition to during the interview—in the observation of a lesson; in other words, the teacher has expressed concern or disappointment in the interview, focusing on a certain point or situation in the lesson. These results are built on interview data on the sources of self-efficacy from Bandura's theory and on aspects of teacher self-efficacy, as well as on observation data from one lesson.

The methodology applied in this study provided only preliminary findings and clues as to how efficacy beliefs develop and change over a short period of time. According to the findings, there is variation, but the research methodology for detecting it needs to be further developed. We believe that with a more advanced research methodology we will get the most valid grip on the formation of the phenomenon (we will return to this later in the discussion). However, our findings are an important intermediate and motivator in the study between sources and teacher self-efficacy, which would take place in the future based on an even more holistic—albeit nuanced—approach.

Frequent experiences of failure also link to negative emotions, but those experiences can also activate thinking in future teaching situations. Some of the teachers in this study showed quite critical and advanced thinking after a particular lesson that they had experienced as negative. These types of situations may ultimately elevate teachers' sense of self-efficacy; that is, experience has led them to devise some alternate strategy that they believe will work better in the future.

On the other hand, it must be noted that the findings of this study are difficult to correlate with earlier empirical studies on the relationship between teachers' self-efficacy and its sources. This is mainly due to the differential nature of research methodological solutions; we have sought to examine teachers' self-efficacy in a situation-focused manner and simultaneously utilize two data sources. The closest reference point is a very recent study using quantitative research methodology (Rupp & Becker, 2021), in which potential variation occurs within six lessons, but individual lessons are assumed to be stable. That study shows that self-efficacy is developing in teacher education, especially during the teaching practicum. Moreover, those findings are compatible with the social cognitive theory of Bandura (1997); that is, sources and experiences influence the formation of teachers' self-efficacy beliefs.

The whole essence of the social cognitive theory lies in the fact that, for example, experiences are positively repeated in sufficient numbers. However, negative experiences can also be repeated, and thus are likely to lower a teacher's self-efficacy. On the other hand, teachers' own learning also means that there will be fewer and fewer negative experiences in the future. Although the stability, rise, and decline of self-efficacy can be analyzed for a longer perspective of time, it does not negate the need to microscopically examine teachers' individual situation-focused observations of teaching, the experiences and interpretations targeted at them, and their reliance on their constructed self-efficacy beliefs. So, although we are interested in “final output,” a kind of cumulative and summative self-efficacy, individual

moments and even short periods have their meaning. In fact, understanding the mechanism of self-efficacy necessarily requires that the process of teaching be qualitatively analyzed, through both events and related teacher interpretations.

Mediative thought-process-focused thinking from sources of self-efficacy is supported by this study. In other words, quite often the teacher speaks of the experience of teaching success, but at the same time attaches ideas to the experiences of success—either the models or feedback from the teacher on the previous lesson has inspired teaching planning, and, accordingly, progress has been made in certain forms of teaching implementation. This interpretation also receives support from some of the few previous qualitative studies. For example, Pfitzner-Eden (2016, p. 13) writes, “This study showed that positive feedback from the mentor teacher has a significant positive influence on the development of preservice teachers’ TSE, possibly via the perception of mastery experiences.” Sources link to each other, at least in such a way that other sources play an important role in the construction of master experiences, that is, they have a mediating meaning. In the interview data for this study, feedback and master experience often link in ways similar to the study by Pfitzner-Eden. Research findings of Palmer (2011), Klassen and Durksen (2014), Rupp and Becker (2021), and Iaochite and Costa Filhon (2016) also support an interpretation in which other sources of self-efficacy support the formation of master experiences, thus furthering the teacher’s self-efficacy.

The role of emotions is more complex. Quite often they go hand in hand with master experiences, that is, they reinforce the experiences—both in a positive and negative sense. However, their causal role is different from that of vicarious experiences and social persuasion: emotions are built from the inside of a person, like master experiences or the teacher’s own experiences in general. As such, they are not in a straightforward and one-way causal direction in relation to master experiences, but rather, as one earlier study has shown, they can be interpreted as consequences of self-efficacy (Chen, 2019). On the other hand, they play a causal role in the long run, as Bandura’s (1997) theory suggests: Positive emotions, for example, joy and pleasure, increase the likelihood of teaching events in the future that have previously encompassed these same emotions.

The problematics in this study also concern the congruence of two data sets, that is, whether interviewing and observing give similar insights into the self-efficacy of a teacher. For the most part, congruence manifests itself in this data. In other words, the teacher brings up all the source categories in a positive light and demonstrates self-efficacy in an interview; also the lesson observational material gives a positive impression of the quality of the teaching. Congruence is also good if there are problems with the quality of teaching as well as problems reflected in the teacher’s interview. However, if different data sets suggest contradiction, then congruence is weak. This creates research methodological problems for interpretation, that is, we do not know with certainty whether the student teacher self-efficacy under investigation is genuinely high or not for a specific period of time (see Elle and Henni in the data of this study).

A key research methodological challenge relates to the fluctuation of teacher self-efficacy. It is not just how the teacher’s self-efficacy is studied according to the main category of research methodology, that is, quantitatively, qualitatively, or using a mixed-methods approach. It is about a significantly more nuanced research methodological challenge, because the research is concerned with not only the statistical invariances and qualitative (factual)

connections, but also the causal mechanisms (i.e., how the teacher's self-efficacy is constructed in time).

We can then continue to ask and consider which factors are behind the “sources.” This leads us to consider, for example, the goals, intention, culture, and theoretical content of teacher education. It is also a question of methodology, as quantitative research has traditionally been interested in correlative sources of self-efficacy. Instead, a newer *holistic, multidimensional person-centered approach* is sought, as Perera, Calkins, and Part (2019, p. 186) describes in their study: “. . .to posit several predictors of teacher self-efficacy profile membership, including professional development provisions and needs, mentoring experiences, gender, and teaching experience, and outcomes of profile membership, including job satisfaction, perceived classroom climate, and teacher collaboration.” A person-centered and holistic approach—albeit quantitative—is perhaps more successful than a variable-centered one in finding the factors on which teachers' self-efficacy is interactively constructed. However, in addition to that more advanced quantitative methodology, there is also a need for a microscopic and qualitative research methodology that focuses on analyzing the variation of self-efficacy “within” a teacher, and its association with other factors—*from lesson to lesson, and even within a lesson*, as in our study.

A review by Morris et al. (2017) presents a few example studies that have applied new research methodological thinking to the study of teacher self-efficacy. They ponder the subject under the heading “Directions for Future Research” and present a study by Gabriele and Joram (2007). In that study, researchers asked teachers to verbalize their reflective thinking processes immediately after teaching. Morris et al. conclude that “a similar approach could be to offer a playback session of a teaching segment and ask teachers to describe even minor changes in their sense of efficacy on a moment-to-moment basis” (p. 824). Those ideas, as described earlier, along with previous research findings on the sources of teacher self-efficacy, lead to the conclusion that the research methodology that is committed to the phenomenon should be further developed. One relevant direction would be *to actively utilize video, targeting an educational event as part of an interview with a teacher*, thus enabling even more targeted exploration of teacher thinking in the context where it has taken place. It would also be essential to examine against a wider frame of reference why the self-efficacy of one particular teacher develops to a high level and why we cannot detect a similar trend in another teacher. An interesting and important research question would also be which types of individual situations bring teachers' self-efficacy beliefs into decline. Is the question just about the teacher's personal interpretation, or are certain kinds of problematics in the teaching process typically behind a downward trend?

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