

Measuring Student Teachers Level of Situation-Specific Skills for Need-Supportive Teaching

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ABSTRACT

In the contextual model of teacher competence by Blömeke et al. (2015), teachers' situation-specific skills, like perception, interpretation, and decision-making (PID-skills) are regarded as central aspects that determine the performance of teachers in a classroom and are deemed as processes that revolve around student thinking and learning (Santagata & Yeh, 2016). Teachers' ability to notice and meet students' needs, in turn, influences their motivation and engagement in learning. In need-supportive teaching, teachers use instructional behaviors that support students' basic psychological needs for competence, autonomy, and relatedness. The aim of the current qualitative study was to assess student teachers' level of PID-skills for needs supportive teaching. Due to the situative characteristics of PID-skills, authentic classroom videos were selected to assess student teachers' noticing, analyzing and decision-making skills. After watching video clips, semi-structured interviews were carried out. Content analysis was used to discover what aspects student teachers notice; what is the level of their interpretation and decision-making. The study was conducted with 10 first-year MA-level students of several subjects teachers' programme. The results of the study reveal that although noticing skills are of a good level, interpretation and decision-making skills can be described through lower levels, which indicate the need to pay more attention on the targeted development of student teachers PID-skills in teacher education.

Keywords: self-determination theory, basic psychological needs, teacher situation-specific cognitive processing skills, video based measurement

Introduction

The theoretical framework for this study is based on the contextual model of teacher competence (Blömeke et al., 2015), which establishes that teachers competence consists of their dispositional aspects, situation-specific skills (PID-skills) and performance (Figure 1).

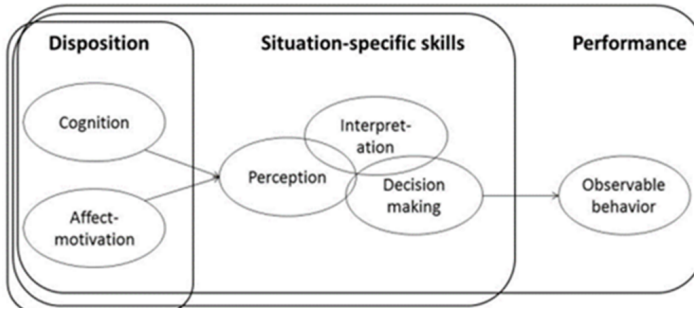


Figure 1. Contextual model of teacher competence (Blömeke et al., 2015)

According to the model, PID-skills function as a bridge between knowledge and classroom actions, where theoretical knowledge is translated into visible teacher behaviour.

Teacher PID-skills are employed in solving complex classroom situations and supporting student learning. Dealing with the complexity of the classroom requires, on the one hand the ability to choose where to target one's attention (Kaiser et al., 2017) and on the other hand, the ability to interpret the situations with theoretical reasoning in mind and make decisions that would support student learning processes. For high quality teaching, knowledge is not sufficient, but situation-specific skills are extremely important (Stahnke & Blömeke, 2021).

Perception has been described as noticing important or noteworthy aspects that influence student learning in a positive or negative way (e.g. Van Es & Sherin, 2002; Seidel & Stürmer, 2014; Alwast & Vorhölter, 2022). In this study, teacher noticing is conceptualized through paying attention to aspects, which are important from the perspective of need supportive teaching. Interpretation refers to the ability to use what one knows to reason about a situation. This means linking classroom events to professional knowledge and clarifying situations according to the components of teaching involved (Seidel & Stürmer, 2014).

Decision-making is characterized as making pedagogical decisions based on the interpretation (Alwast & Vorhölter, 2022). More precisely, decision-making has been characterized through predicting consequences or anticipating responses to student learning and behavior based on the viewed classroom events (Blömeke et al., 2015; Seidel & Stürmer, 2014) or offering alternative solutions and courses of action or more effective teaching strategies (Blömeke et al., 2015, Santagata & Yeh, 2016; van Es & Sherin, 2002).

As self-determination theory (SDT) (Jang, Reeve & Deci, 2010) is the central theory in our teacher education, we were interested in finding out to what extent our student teachers are able to notice need-supportive teaching and supporting

or thwarting student basic psychological needs in the classroom, as well as exploring the level of their interpretation and decision-making skills. The theory practice gap has been well documented in teacher education research and since situation-specific skills function as the bridge between theory and practice, it is important to analyze the level of student teachers PID-skills, in order to support the development thereof during teacher education.

The aim of this study was to pilot instruments for assessing PID-skills created based on previous research (Chan & Yau, 2021; Kersting, 2008; Van Es, 2011; Alwast & Vorhölter, 2022) and analyze the nature of our student teachers PID-skills, in order to determine best possible solutions for supporting the development of these skills during teacher education studies.

The following research questions were formulated:

1. What is the level of student teacher perception regarding need-supportive teaching and what kind of aspects do student teachers notice in the classroom episodes regarding basic psychological needs (i.e. autonomy, competence, relatedness) satisfaction?
2. What is the level of teacher interpretation skills, i.e. to what extent is interpretation evident through evidence-based reasoning and how much is based on personal experience or without sound reasoning?
3. What is the level of teacher decision-making skills, i.e. to what extent are the proposed alternative solutions supported by theoretical reasoning of SDT?

Methodology

Participants

The participants of the study comprised 1st year students of several subjects teachers' MA teacher education programme ($n = 10$). 9 of the participants were female and 1 was male, the average age of the participants was 36.6 (min = 23, max = 52). Half of the participants in the study had already undergone a theoretical course about SDT and need-supportive teaching and half had not. Convenience sampling (Merriam & Tisdell, 2015) was used. Participation in the study was voluntary and informed consent was obtained. Interview transcripts were saved with a pseudonym to preserve the anonymity of the participant and ensure the reliability of data analysis. All of the participants were given the opportunity to review the transcript prior to data analysis.

Data collection

5-minute video clips of authentic classroom situations formed the basis for this study. First, video selection process, which comprised several stages was carried out. Altogether 15 45-minute classroom videos were rated using

the autonomy support rating sheet (Jang, Reeve & Deci, 2010) and the list of observed need-supportive teaching behaviour (Van den Berghe et al., 2013). Using the coding schemes, three 5-minute video clips that featured most aspects of need- supportive or thwarting strategies were selected.

As the next step one-on-one interviews using video stimulated recall protocol were carried out with the participants. In course of the semi-structured interviews, participants watched the 3 clips from basic school lessons and after each clip, were asked prompts based on Chan & Yau (2021). Questions that the participants had to answer were:

- 1) What did you notice? The question was repeated until the participant had nothing else left to add.
- 2) How would you explain the teacher's actions? Why do you think the teacher chose to act in the way she did?
- 3) If you had been the teacher in that classroom, what would you have done differently in order to support student motivation?
- 4) Why do you think that your proposed alternative solution would support student motivation better?

Data analysis

A multi-category coding scheme was developed for content analysis. As the first coding process, reducing procedures and structural procedures (Mayring, 2014) were applied, in order to reduce the amount of material so that only essential content remains and it is structured in a clearer way to facilitate further analysis. Data units were selected from the interview transcripts and coded deductively following the three phases of the PID-model (perception, interpretation, decision-making). In total, 549 data items were determined: perception (252), interpretation (204) and decision-making (93).

In the next phase, each category of PID-skills were coded separately following coding protocols formulated based on previous research (e.g. Kersting, 2008; Van Es, 2011; Alwast & Vorhölter, 2022). For the purpose of analyzing perception, two main categories were developed based on SDT (Jang, Reeve & Deci, 2010): relevance to autonomy supportive teaching and not relevant to autonomy supportive teaching. Further subcategories for those items classified as relevant to autonomy supportive teaching were: need for autonomy, need for relatedness and need for competence. Entries categorized as not relevant to autonomy supportive teaching were further categorized inductively. The aim in analyzing interpreting and decision-making was to clarify what kind of knowledge the participants use in their reasoning and how much of it was evidence based. Categories based on previous research (e.g. Kersting, 2008; Van Es, 2011; Alwast & Vorhölter, 2022) were used to analyze student teachers' interpretation and decision-making skills in classroom situations. Descriptions of the levels underlying the analysis are given in Table 1.

Table 1. Interpretation and decision-making evaluation model

Level	Definition	Example
Interpretation		
Level 1	General comments and pure descriptions about the episode they observed, “often oversimplifying the complexity of the classroom episode they observed” (Van Es, 2011). Comments evaluative without offering actual evidence to their claims, mainly rephrasing what they noticed. Comments are highly judgmental and evaluative in nature (Van Es, 2011). No support from the observed video clips offered to support their claims.	The students’ motivation in this lesson was not supported at all. Student motivation was really well supported in this lesson, the teacher gave choices.
Level 2	Tries to reason and make sense about the noticed situation. Interpretation is based on own experience or without bringing out clear links to theory. “Some analytic inference occurs” (Kersting, 2008), teachers state the indicators for selecting a specific aspect (Alwast & Vorhölter, 2022)	I suppose the teacher gave the students a choice, because in my experience it has also been an effective way of making them more motivated.
Level 3	Interprets the noticed aspect clearly through theoretical reasoning. Teacher “makes connections between events and principles of teaching and learning” (Van Es, 2011)	The teacher in the lesson clearly stated the importance of that specific topic, since identifying value and importance nurtures inner motivational resources.
Decision-making		
Level 1	No alternative solutions are offered OR Alternative solutions are offered, but they are irrelevant in terms of autonomy-supportive teaching. (not connected to motivation)	I don’t know what the teacher could do differently. The teacher could stop asking the students to stand up at the beginning of the lesson.
Level 2	Predictions or alternative solutions are vague and generic or connected to personal experience and without sound evidence. (connected to motivation)	What I have done, when I see that students are really not into the task I gave them, is try to come up with some aspects of the task, where they can decide themselves how to do it. I don’t know why, but it seems to work.
Level 3	Alternative solutions or predictions, which are offered are clearly evidence-based and related to the topic of observation (connected to motivation)	As we have learned, giving constructive feedback to students on how they are doing, supports their need for competence.

Results

Level of student teachers' perception regarding need-supportive teaching

Perception items were categorized deductively according to SDT and the items, which could not be categorized as autonomy, competence or relatedness supportive, were categorized “not relevant to need-supportive teaching” and further coded inductively, in order to discover what the main topics are that teachers notice in classroom practices. Table 2 gives an overview of the division of idea units (sentences or phrases representing a distinct topic) representing perception.

We assumed that the group who had undergone the theoretical course could be able to notice more relevant events in the classroom and our findings also supported this assumption.

Table 2. Overview of the division of perception data units according to SDT

	Total	Not relevant	Autonomy	Competence	Relatedness
Perception	252	49	124	64	15
SDT course completed	152	21	83	36	12
SDT course not completed	100	28	41	28	3

When looking at the category “Relevant to autonomy supportive teaching” and more precisely the subcategories of need for autonomy, competence and relatedness, we can see that autonomy is the prevailing category. Regarding autonomy, the noticed aspects were most often connected to the pace of the lesson (e.g. “It was a bit disturbing that she was hurrying them up all the time;” “It was very intense, the teacher was hurrying up a lot”), teacher language use (e.g. “There was quite a lot of imperative mood used;” “Teacher uses complicated words”); ways of questioning (e.g. “She only said a few times who has to answer, it was mostly voluntary;” “Asking why and how you are thinking – she was guiding with her questions”), active engagement of students to testing and experimenting (e.g. “She did not say, give the students a moment, where they could think about, why that knowledge was actually important;” “It was positive that the teacher did a practical task, they took the concept “turns” and did a practical task at once”), offering choice (e.g. “She actually gave a choice, whether to do together or try alone at first;” “The students in that clip really did not have much choice;”), connecting to prior knowledge (e.g. “It was very interesting that she did not let the students remember themselves, but constantly said “You remember, right” and “We talked about this and this and the rule is this and this;” “Referencing to what was done before activates prior knowledge”) and offering encouragement and clues (e.g. “She gave hints, directed

the students to understand it more by themselves;" "She actually constantly helped them to remember"). What stood out from the results was that the prevailing categories were noticed by both groups and the qualitative difference in noticing did not manifest in the difference in noticing need-supportive strategies, but mainly in the sheer volume of noticing aspects and somewhat in the detail-richness of the made comments. The same pattern was observed also in the case of competence.

The main topics that were noticed regarding competence were connected to feedback (e.g. "The teacher gave no feedback;" "She gave praise, but it was just "Well done" and did not specify what was well or had been done well;"), instructions (e.g. "Working memory is supported here. The teacher writes on the blackboard, which task they are doing at the moment;" "She told to open the textbook or workbook and wrote the page number on the blackboard at once"), and lesson objectives (e.g. "I liked that the teacher explained the content of the lesson at the beginning;" "At the beginning, lesson goals were brought out, but at the same time, she did not ask them from the students, but just said that these are the questions we are going to answer during the lesson").

The need for relatedness was the least represented category, where the perceived aspects fell under the topics pair- and groupwork (e.g. "They did pair-work;" "It was nice that they could work in pairs"), cooperative learning (e.g. "There were no possibilities for cooperative learning;" "The students could not really offer help to each other;" "They practiced together") and lack of relatedness support (e.g. "I didn't notice anything connected to relatedness that could have supported it;" "There wasn't much relatedness"). Here, quantitative and qualitative differences were noted, as only 3 out of 15 occurrences of noticings connected to relatedness were made by the group who had not completed the theoretical course and all three instances reported on the students practicing together with the teacher.

As seen from Table 2, the majority of data items under perception did fall under categories deduced from SDT with only 49 data items out of 252 classified as not relevant to need- supportive teaching. The main topics, which were coded as not relevant were mainly connected to teacher and students behavioural aspects (e.g. "Someone yawned;" "They stood up at the beginning of the lesson;" "The teacher had a loud voice") lesson materialistic content related (e.g. "They had a worksheet;" "They used a globe") and task description (e.g. "They read a poem;" "They read the text out loud"), where teachers simply offered descriptions of the noticed activity or the environment.

Level of student teachers' interpretation and decision-making regarding need-supportive teaching

Idea units categorized as interpretation and decision-making were both further categorized into 3 levels based on the quality of the utterances. Table 3 gives an overview of the division of interpretation levels.

Table 3. Overview of the division of interpretation levels

		Level 1	Level 2	Level 3
Total	204	90	82	30
SDT course completed	115	51	37	26
SDT course not completed	88	39	45	4

Regarding interpretation, Level 1 items were characterized as being general comments about the observed aspects, which either oversimplified the classroom event, mainly rephrased what was noticed or were evaluative without offering any evidence to the claim (e.g. "It was a very strict classroom;" "They cannot feel bored, because they are active;" "It was kind of dull rule learning"). Level 2 items were characterized by being based on one's own experience, without bringing clear links to theory, however, some analytical inference occurs (Kersting, 2008). Some of the typical examples in Level 2 included: "I personally don't think that this is important, it somehow implies that orders are given and if you don't comply then I think that this is demotivational" and "Practical tasks, especially for younger classes, are really beneficial, but they also work well for older classes, because students always like to make posters, discuss with each other, draw, make some kind of summaries, so as one part of a lesson, it is definitely very motivating." Level 3 characterizes items, where clear theoretical reasoning of the noticed aspect is offered and clear connections made between the observed events and principles of teaching and learning (Van Es, 2011). Level 3 typical responses include, for example: "Perhaps autonomy isn't supported very much, but it does help a bit that they got to set the goal together, indirectly together, because it was already set, but they got to ask questions themselves." and "It is connected to competence, where they feel that it is not something completely new for them, but that specific task is connected to previous things."

For the purpose of this study, decision-making was contextualized through being able to offer alternative and more effective solutions and the goal was to find out to what extent the offered solutions were evidence-based and related to the specific topic of observation. Table 4 illustrates the division of decision-making levels.

Table 4. Overview of the division of decision-making levels

		Level 1	Level 2	Level 3
Total	93	20	73	0
SDT course completed	62	13	48	0
SDT course not completed	32	7	25	0

Level 1 was illustrated by lack of alternative solutions or offered solutions, which were irrelevant to the focal topic. The majority of the decisions in Level 1 were connected to organizing tasks (“I would read from the textbook first;” “I would have them turn around the right shoulder, not the left one”), rearranging seating (“I would rearrange seating”) or standing up for greeting (“I would not have them stand up at the beginning of the lesson”). These categories and examples illustrated the responses of both groups of student teachers with the only difference being that rearranging seating was brought out only by the group that had not completed the SDT course. Level 2 responses, which formed an overwhelming majority of the responses in this category, indicate the type of answer, where the offered alternative solution is either generic or vague or connected to personal experience. In all cases they are connected to need-supportive teaching, in order to be classified as Level 2. Here, the alternatives were mostly connected to lesson structure and task content (“There should be more possibilities for the students to do different tasks;” “Maybe it is possible to make some kind of flashcards or a task on an interactive board. Maybe this would create a bit more of this good excitement”), checking student understanding and giving feedback (“They could have had the chance to check themselves, give some kind of feedback;” “I would ask guiding questions”), teacher visible behaviour and pace of the lesson (“I would give them more time to think;” “I might have written the topics on the blackboard, so they would have been in front of the eyes;” “I would explain the task more slowly”); connecting to previous knowledge and supporting self-direction (“I would let the student try to remember the previous lesson more actively;” “I would let them try on their own for a while”). No instances out of the 93 data items categorized as decision-making were classified as Level 3, which described the instance of offered alternative solution being clearly evidence-based.

Discussion

The aim of the current study was to explore the level of student teachers’ situation-specific skills for need-supportive teaching using video stimulated recall method that has been proven to be a valid instrument for assessing PID-skills by numerous studies (e.g. Kersting, 2008; Seidel & Stürmer, 2014). As situation-specific skills are described as processes through which knowledge and

beliefs become relevant in practice (Santagata & Yeh, 2016), it is important to know the quality of student teachers PID-skills for need-supportive teaching, to better understand what they notice and to what extent they are able to transfer theoretical knowledge to classroom practice, in order to support the further development of these skills.

The results of this study revealed that regarding need-supportive teaching, noticing abilities of our teacher students in both groups are of a good level, proven by the fact that the vast majority of noticed aspects were connected to basic psychological needs support or lack thereof. Research into perception has stated that the ability to notice is a skill that develops over time (e.g. Van Es & Sherin, 2002; Keppens et al., 2019) and the competence continuum model shows that PID-skills are influenced by teacher knowledge (Blömeke et al., 2015), i.e. we tend to notice what we know. This explains why student teachers who had previously learnt about SDT noticed more aspects in the classroom videos than the group who had not. However, the study also offered an interesting finding regarding relatedness, which was the least noticed category in perception. Teachers were clearly less capable of noticing aspects that support the creation of a warm and safe classroom environment and paying attention to aspects such as tone of voice, body language, eye-contact, physical proximity to the students. Forming supportive and warm relationships is highly important and has positive effects on student achievement and engagement among other factors (Kincade et al., 2020) and it has been documented by a number of studies that students who believe that their teachers are caring and supportive pay more attention in the lessons (Wentzel, 1997) and are more motivated (Murdock & Miller, 2003). Keeping this knowledge in mind and at the same time seeing that teachers notice aspects related to the formation of warm and caring classroom relationships the least in their observations, gives us a clear indication that more attention needs to be paid on noticing and acknowledging these aspects in teaching.

Regarding interpretation and decision-making skills, the study also revealed several interesting aspects. Santagata & Yeh (2016) argue that PID-skills improve in sophistication over time and this sophistication is revealed through more detailed and coherent interpretations. Based on this, we could hypothesize that the group who had completed the theoretical course would offer interpretations that would fall into the categories of Level 2 and 3. Even though, we see that the group who had completed the SDT course offered more interpretations in Level 3 than the group who had not completed the course, but, in terms of Level 2, an opposite pattern emerged. Moreover, when looking at the whole-some picture of the data, it is revealed that for both groups, Level 1 answers, which indicate descriptive, judgemental and theoretically unproven interpretations form the largest group of responses. On the one hand, this result could be explained by the fact that the participants were at the very beginning of

their teacher education studies, which falls in line with the results of Alwast & Vorhölter (2022). On the other hand, the lower level results revealed in our study indicate that sufficient attention has not been paid on deliberate practicing of PID-skills during the theoretical course to have an impact on the PID- skills of the teachers. This falls in line with previous findings that stress the importance of deliberate practice opportunities for the development of situation-specific skills (Santagata & Yeh, 2016) and that it is not enough for the development of PID-skills to just reflect on classroom events or learning situations, but targeted attention needs to be paid to the interpreting those events and justifying the made decisions (Lin et al., 2005).

The same kind of indication is given by the data regarding decision-making. The overwhelming majority of the responses were assessed as Level 2, which indicates vague and generic answers based on personal experience, but connected to the central topics, i.e. motivation. This result can be explained through our knowledge of teacher beliefs that affect the development of their teaching practice. Richardson (1996) states that teacher education students enter studies with beliefs that strongly influence their learning, which are heavily influenced by their own experiences as students. The question for teacher education lies in finding ways to support the development of interpretation skills, so that student teachers would be more aware of their belief systems on the one hand and, on the other hand, engage in their classroom practices more on the beliefs based on formal knowledge, rather than on beliefs based on their personal schooling experiences. Furthermore, no responses were deemed Level 3 indicating an alternative solution supported by evidence-based reasoning and a number of responses were seen in Level 1, which indicate alternative solutions that are not connected to the topic at hand. There were some differences between the groups that had completed the SDT course and those who had not and it is clearly evident that teachers with theoretical knowledge were able to make more decisions, which corresponds with the findings from previous studies on interpretation skills and the expert-novice differences (eg. Stahnke & Blömeke, 2021). However, the fact that they still made decisions based on the noticed and interpreted events that were not connected to learnt theoretical knowledge and were not able to make true evidence-based decisions, paints a picture of an unsatisfactory level of decision-making and gives a clear indication that, in course of teacher education, deliberate practicing opportunities to develop PID-skills need to be created. Several possibilities have been highlighted in research that support the development of PID-skills, e.g. analysis of classroom videos (e.g. Van Es & Sherin, 2002; Santagata & Guarino, 2011) or using video-based blended learning environments for classroom video reflection and feedback (e.g. Prilop et al., 2021; Weber et al., 2018). Weber (2018) and Prilop (2021) with colleagues have emphasized the importance of expert feedback in developing PID-skills, noting

that even though feedback by peers or self-reflection helps to foster PID-skills, considerable improvements only emerge in case expert feedback is offered to student teachers.

Even though the current study provided a clearer understanding of the level of teachers' PID-skills regarding need-supportive teaching, some significant limitations can be highlighted. The sample of participants does not allow to make broader generalizations. Furthermore, teacher PID-skills have not been studied in relation to need-supportive learning, so additional studies would definitely be needed to draw more profound conclusions. Teacher beliefs were not addressed in the current study, which would definitely help to understand better the development of teacher PID-skills. Further investigation would benefit from studying the interpretation and decision-making skills at greater length and creating a video-based blended learning environment to provide student teachers deliberate practice opportunities with expert feedback for the development of PID-skills for need-supportive teaching, in order to understand more profoundly the different factors influencing the development of these situation-specific skills.

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