



THE DEVELOPMENT OF PEDAGOGICAL COMPETENCE IN TACIT KNOWING: TOWARDS A POLANYIAN FRAMEWORK FOR THE EMPIRICAL ANALYSIS OF COMPETENCE DEVELOPMENT



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ABSTRACT

Polanyi's theory of personal knowledge provides a paradigmatic conceptual framework for the empirical analysis of tacit knowing and learning. We use this framework to analyze the development of pedagogical competence. Drawing on Polanyi, we regard pedagogical competence as a particular field of professional tacit knowing that relates subsidiary and focal awareness of events in class, effects situated appraisal, and relates events to teaching intentions. The development of pedagogical competence takes place when a teacher struggles to relate teaching intentions to ongoing events in tacit knowing and engages in situated experimentation. Based on Polanyi's conception of subsidiary awareness, focal awareness, and appraisal, we present an empirical vignette from a case study. In it, a teacher engages in situated experimentation to resolve two opposing semantic fields in class: an intended field of interaction, which focuses on the lesson topic, and the field of student peer relations. Based on our analysis, we argue that the teacher's competence development is focused on the educative task of managing students' peer culture, while the teacher's focal awareness remains on the didactical task of teaching a subject.

The Development of Pedagogical Competence in Tacit Knowing

Polanyi's theory of tacit knowing makes it possible to perform an empirical analysis of pedagogical competence, and competence development, because it provides a framework for the interpretation of tacit knowing in teaching situations. Based on Polanyi's theory, we argue that teachers rely on subsidiary awareness to guide their attention in interaction and that they shift their focal awareness to evaluate and relate to meanings expressed by students. Furthermore, we argue that shifts in focal awareness initiate the development of pedagogical competence, which we define, with reference to Dreyfus (2008), as the ability to teach "involvedly and intuitively" without having to make "detached choices for action." In contrast to positivist attempts to reduce competence to explicit knowledge, we endorse Polanyi's conception of competence,

“which authorizes a fiduciary choice made and timed, to the best of the acting person’s ability, as a deliberate yet necessary choice” (*PK*, 332). From a Polanyian perspective, competence is a state in which teachers use their awareness to appraise a pedagogical situation, recognize a unique set of cues in this situation, and relate these cues to their teaching intention. Polanyi argues that competence relies on personal participation, which can only be rational to a certain extent because “all knowledge is either tacit or rooted in tacit knowledge” (*TD*, 24), which means that the existence of “a wholly explicit knowledge is unthinkable” (*TD*, 55, 195; *KB*, 144). Arguing with Polanyi, we presuppose that any explicit knowledge a teacher has is grounded in personal knowing and that this knowing is characteristically procedural, as reflected by the present participle form of the term “tacit knowing.” Consequently, “knowledge is an activity which would be better described as a process of knowing” (*KB*, 132).

Competence development thus takes place as an activity in which teachers tacitly acquire rules that need to be followed in teaching. Competence development in practice is widely inexpressible, a characteristic that Polanyi prominently illustrated through the phrase “we can know more than we can tell” (*TD*, 18). This contrasts with the domain of explicit knowledge, the contents of which we can communicate in the propositional form of language. At the same time, explicit knowledge can never be wholly impersonal, as “even the publicly confirmed and reconfirmed statements of science are rooted in the consensus of professional opinion” (Greene 1974, 57). Polanyi emphasized that competence development is based in personal commitments, which we are unable to specify because we are in them, and “are unable to focus our attention upon [...] without destroying their subsidiary function” (*M*, 61). Polanyi’s theory allows us to emphasize that teaching practice is no mechanical procedure but rather an “art of knowing” (*PK*, 56–57), which cannot be specified in full detail or transmitted positivistically, since no prescription for it exists (Simpson 2019). Rather, competence development requires teachers to make an effort in relation to personal experience (Allen 1978) and requires a “model of an exemplary person (real or imagined)” (Margitay 2010, 82). This means that professional learning requires an ecology that goes beyond curriculum and teacher education programs. As a form of art, teaching relies both on intimations that are tacit in nature and on personal commitments to principles for teaching that are consciously available to the teacher: “To become effective in action the principles of right, wrong, duty, etc. have to operate on the situation subsidiarily or focally. Subsidiarily they give the focal situation tacit intimations of right and wrong. Focally, they analyze the practical situation cognitively” (Broudy 1986, 8). This illustration of tacit knowing clarifies that a teacher who may think critically about teaching cannot resort to critical thinking in teaching practice, which has fundamental consequences for the empirical analysis of teaching.

An empirical analysis of teaching that respects this function needs to be grounded in an epistemology of tacit knowing. Consequently, this paper illustrates a set of elements and processes of tacit knowing, while acknowledging that we cannot fully cover the many epistemological insights that Polanyi provides within a limited space. Such epistemological insights have been discussed in depth by eminent Polanyi scholars such as Greene (1974) and Prosch (1986), on whose analysis of Polanyi we draw to illustrate elements and processes of tacit knowing that are empirically evident in interaction. This focus on empirical evidence is relevant due to our analytical interest in teachers’ competence, which can be analyzed through video data of classroom interaction, as well as their competence development, which can be analyzed through teacher interviews. At the same time, the data we use does not allow us to address processes of cognition because these processes are not evident in video or interview data. Accordingly, we do not engage in an analysis of all processes and aspects of tacit knowing that have been addressed by Polanyi (for an overview of these aspects, see Gulick

2016, 303). Some processes are fundamentally cognitive and thus cannot be analyzed in video and interview data. This includes thoughts active in working memory, psychodynamic factors such as integrations, or indwelling as the result of interiorizing objects so they can function as subsidiaries. Consequently, our analysis focuses on aspects of tacit knowing that are empirically present in data: in video data of classroom interaction, we find phenomena of (a) appraisal, which is documented in the teacher's situated reactions; (b) embodied skill, such as posture, gesture, and bodily movement; (c) expressions of interest, goals, and expectations; and (d) words and grammar used as a means of expressing and evaluating meanings in interaction. These four aspects of tacit knowing can be directly analyzed in video data. Beyond this, interview data can be used to document (e) the personal framework of interpretation consisting of presuppositions and beliefs and (f) connoisseurship as "a tacit feat of intelligence" (*SM*, 23)—these two aspects can be communicated through narratives, as "personal experience through time involves an inherently storied or narrative structure" (Mullins 1993, 112). However, interview data can only be a complement to video data, as it does not provide us with data on tacit knowing that is effectively used in teaching practice. Methodologically, the tacit knowing of professionals can be accessed through interpretative methodologies that provide dedicated tools for the analysis of tacit knowing, such as ethnomethodology and documentary method (Hammersley 2018; Bohnsack 2014). These methodologies present elaborate strategies for the interpretation of competence in skillful practice (Wieser & Klinger 2020).

The analysis of competence in skillful practice by Polanyi features the prominent example of knowing how to ride a bike (*PK*, 51–52; *KB*, 141). Polanyi points out that a cyclist does not possess propositional knowledge about the physical principle of cycling but nonetheless knows how to ride a bike: "From my interrogations of physicists, engineers and bicycle manufacturers, I have come to the conclusion that the principle by which the cyclist keeps his balance is not generally known" (*PK*, 51). Principle here refers to the set of procedural maneuvers necessary for keeping the cyclist in balance throughout a ride. Polanyi accepts the existence of such a principle and assumes that cyclists know this principle tacitly, and not as a set of propositions (*PK*, 91). Nor is it, to begin with, possible to learn to keep balance on a bike by trying to follow an explicit rule (*M*, 41). Knowing how to ride a bike is widely used as an example of somatic tacit knowing that is independent of culture (Collins 2013). Building on Polanyi, we argue that tacit knowing is not only important for cyclists but also for professionals: Polanyi himself uses surgeons as an example of professionals who rely on tacit knowing. In his example, surgeons hold propositional knowledge about the topography of an organ but are not able to articulate the professional knowing used to perform an operation. Operating is described as an example of professional tacit knowing in which surgeons relate generalized explicit knowledge from anatomy to a particular of vessels and tissue. Interestingly, Polanyi underlines that professional tacit knowing is ineffable and that a surgeon "is in fact using his intelligence very much like a rat running in a maze" (*PK*, 94). Together, the cyclist and the surgeon examples illustrate that ineffability is characteristic of both somatic and professional tacit knowing. The central difference between these two types of tacit knowing is that somatic tacit knowing, such as riding a bicycle, is less dependent on immersion in a culture, while professional tacit knowing depends on becoming socially embedded in the appropriate group of experts (Collins 2013, 258). More specifically with respect to teachers, Broudy (1965, 410) argues that professionalism depends on immersion in explicit professional knowledge, which creates a "body of systematized knowledge organized in distinctive problems." Such professional knowledge is described in the disciplinary fields of education. As a discipline, education in the continental-European tradition is typically described as encompassing three central domains (English 2013, 5): content knowledge about the subject,

didactical knowledge about the organization of subject-specific teaching and learning, and educative knowledge about moral guidance and personal formation beyond subject-related learning. Content knowledge as well as principles of didactic and educative knowledge can be transmitted in teacher education and together provide professional pedagogical knowledge, while awareness of cues and events in class needs to be learned in practice. Based on this description of professional pedagogical knowledge for teaching and the relation of explicit knowledge and tacit knowing, we use the following section to illustrate how Polanyi's conception of tacit knowing can be used in empirical research focusing on pedagogical competence.

In the empirical analysis of professional tacit knowing, the relationship between tacit knowing and awareness is of central importance. Awareness in skillful practice, and the dependency of focal awareness on a tacit awareness of subsidiary elements, is one central aspect of Polanyi's conception of tacit knowing. Polanyi provides an account of the relation between tacit knowing and awareness in skillful practice and argues that our ability to be focally aware of an object (or event) relies on a tacit awareness of subsidiary elements of this object. Pedagogical competence is no exception to this, since teaching always relies on the interpretation of a situation in class and on an understanding of the classroom context. Pedagogical competence is therefore expressed in shifts of orientation that relate to different didactical and educative objects of awareness. Polanyi's theory illustrates the existence of different ranges of expressibility, different types of awareness, and different forms of intention. Taken together, this enables us to establish an elaborate conception of pedagogical competence and its development.

Elements of a Polanyian Theory of Competence Development

Polanyi's theory of tacit knowing allows us to identify elements of professional involvement in education. Based on our empirical interest, we find the central elements of Polanyi's theory to be subsidiary awareness, focal awareness, and situated appraisal. These elements are outlined in the following paragraphs, which focus on the pedagogical competence of teachers.

Subsidiary awareness enables teachers to know what is going on in class. It is characterized as tacit and non-propositional, which makes it difficult for teachers to cognitively access and describe what they were aware of in a particular situation and how this awareness guided their practice. However, these characteristics enable performance because teachers do not have to consider what they are doing and can refrain from thinking about the premises for their practice. Following this assumption, teachers have limited access to tacit knowing in practice because it is only possible to maintain their practice if they avoid any explicit consideration of appropriate actions: "He [the practitioner] knew what he was then doing, not in the sense that he had to dilute his consideration of his premises with other acts of considering his consideration of them" (Ryle 2009, 158). Subsidiary awareness thus enables teachers to intentionally approach a teaching objective. In aiming for this objective, teachers are subsidiarily aware of cues and events in class that are relevant with respect to this objective. Subsidiary awareness is brought into focal awareness when an event requires attention, e.g., when learners need support during an exercise. In focal awareness, teachers attend directly to elements of a situation to adjust their teaching practice. The process of adjusting teaching to suit events in class is widely non-deliberative and enables teachers to comprehend elements of a situation and the relationship between them. This comprehension takes place through situated appraisal.

Appraisal refers to the process in which the involved engagement of teachers with a situation leads to comprehension of its constitutive elements. In appraisal, teachers assess the constitutive elements of a situation and relate them to a teaching objective. Elements that are relevant to reach a teaching objective are

brought into focal awareness, while teachers remain subsidiarily aware of other elements that support action towards an objective. Taken together, subsidiary and focal awareness support the achievement of a teaching objective: in a teaching situation, teachers use their awareness of student reactions to adapt their teaching, for example because they become aware that students need a different explanation of an illustration that was shown on PowerPoint. Functionally, appraisal enables teachers to perform in class because it provides a “from-to knowing” for action (*M*, 34). During appraisal, teachers experience the classroom situation as a whole and not as a set of individual elements—the latter would require an established appraisal of a situation to which elements can be related (a “given” situation). As phenomena, appraisals are present in “practical knowledge” (*M*, 41), particularly in situations where practitioners are reflecting in practice: “By reflecting on the way we are performing it [the act] we may seek to establish rules for our own guidance in this act” (*PK*, 30). Again, this guidance does not rely on critical reasoning, which would require teachers to reflect on how to act and to reflect on the corresponding mode of reflection. This reveals another key characteristic of appraisal: appraisal takes place independent of critical reasoning because it accommodates the singularity of a situated event and integrates subsidiary awareness into focal awareness to act in a situation.

From a Polanyian perspective, the development of pedagogical competence takes place in involved practice, with teachers engaging in situations and using situated appraisal to achieve a teaching intention. The development of pedagogical competence originates in a specific type of experience: when teachers experience a teaching situation in which their knowing does not enable them to relate an event in class to their teaching intention, their from-to knowing no longer provides an orientation from the current situation to an intended outcome. In the introduction to *KB* (xvi), Grene argues that “all knowing is a kind of orientation, in which we rely on clues within our bodies to reach beyond ourselves, to attend what is out there.” This experience forces teachers to experiment within a surprising situation to identify its constitutive elements. In experimentation, teachers bring elements of a situation into focal awareness for at least two reasons: (1) to find out if they are constitutive of the event and (2) to arrive at a new from-to knowing that addresses the event. In experimentation, teachers re-relate the intentions of teaching to a situation in order to comprehend an event and arrive at appropriate orientations for practice. In this way, teachers establish a new orientation that provides from-to knowing that guides them through a surprising situation. In doing so, teachers develop their competence, and their set of orientations is transformed. Figure 1 provides a visual overview of the functional elements of tacit knowing that we have described. In this figure, elements of tacit knowing that orient practice are illustrated as boxes, whereas the process of the development of new orientations is illustrated with arrows.

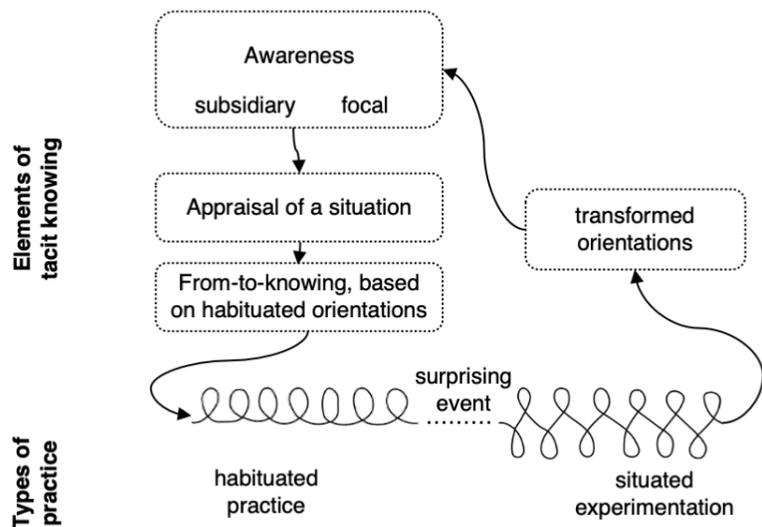


Figure 1:
The development of pedagogical competence in tacit knowing

The Empirical Analysis of Competence Development: A Vignette of an Experienced Secondary School Teacher's Development of Pedagogical Competence

The following vignette focuses on the tacit knowing of an experienced secondary school teacher named Patrick and illustrates his competence development. Drawing on Polanyi, we demonstrate that Patrick uses tacit knowing to make his students focally aware of the lesson topic. This discussion can be seen as a social process in which teachers communicate personal meaning about a topic and relate to the meaning that students communicate, which involves both content and didactical knowledge. The vignette itself is taken from a case study that focuses on a series of economics lessons in a grade 9 class in an Austrian secondary school.

Polanyi's theory enables us to comprehend the way in which tacit knowing grounds teaching practice, that is, how subsidiary and focal awareness continually provide orientations for teaching. As argued in the first section of the paper, some aspects of tacit knowing, such as teachers' focal awareness and appraisal, are empirically present in video data. The content of this focal awareness can be identified through the sequential analysis of teachers' actions and their reactions to students. Sequential analysis also allows us to determine how teachers appraise a situation, based on the way they react to previous action. However, some elements of tacit knowing are not empirically present in our data. Subsidiary awareness, the orientations on which we rely to attend to a situation around us, also known as the "proximal term" of tacit knowing (*KB*, 140), remains widely absent in video data. Furthermore, video data of classroom interaction documents involved practice and does not allow for an analysis of teachers' theoretical knowledge used to interpret pedagogical situations. Such knowledge can be accessed through interviews, which provide a space for teachers to express considerations with respect to the aims and objectives of teaching and curriculum decisions. Using Broudy's distinction of teaching as a craft and teaching as a profession (quoted in Simpson 2019), we emphasize that interviews provide an opportunity to analyze professionalism as the relation between theoretical knowledge on education, educative aims, and practice. However, such a perspective excludes the craft aspect of teaching, which we argue needs to be regarded as much as professional aspects of teaching, given the significant numbers of teachers leaving the profession at an early career stage (Johnson et al. 2019; Whalen et al. 2019). Following these considerations, the subsequent analysis focuses on video data and the craft of teaching.

Data was collected through video ethnography (Wieser 2015) and analyzed using a documentary method approach (Wieser & Klinger 2020). Documentary method is particularly useful for the analysis of tacit knowing due to its dedicated focus on tacit knowing in interpretative analysis, which includes two steps (Bohnsack 2014): (1) Formulating interpretation focuses on what is being said, the explicit meaning in interaction expressed through language. This step aims to describe the topical structure of interaction. (2) Reflective interpretation focuses on how things are said, referring to the implicit meaning that is documented in the way a person relates to previous actions and events through a speech act. Our analysis of tacit knowing thus focuses on the relation between an action and the way in which a reaction relates to the context of previous actions. The interpretation of the sequential relation between action and reaction makes it possible to describe the orientations in which a person reacts to previous actions and events. Consequently, this approach enables an analysis of tacit knowing that is inexpressible for the practitioner.

Patrick's teaching, documented in video data, reveals his intention to make the semantic field of economics appear in class. Semantic field refers to a space of relationally held meanings of a group: "In the very act of specifying semantic fields, people engage in an act of closure whereby they become conscious of what

they have excluded and what they must therefore include” (Ingold 2005, 127). In school, semantic fields often relate to two meanings: the meaning of the subject taught and the meaning of peer relations within the student group, which reflects social status and group membership. In institutional schooling, these semantic fields are frequently opposed to each other: A teacher commonly intends to focus interaction on the semantic field of the subject taught, while students do not necessarily share this focus. Rather frequently, we observe that student interaction focuses on peer relations and social status instead. This opposition is present in our vignette, where the students focus on their peer relations while Patrick experiments with the situation to refocus the semantic field on economics.

To focus the semantic field on economics, Patrick starts to present concepts and representations of economics and discusses them with the students. This way, he establishes an initial contact between the students and the field of economics. This contact emerges through a presentation of concepts (such as market and market structures) and models (such as Maslow’s hierarchy of needs and a video clip that models the relationship between wishes, needs, and demand). Patrick’s presentation is accompanied by statements from the students, who share their thoughts and ad-hoc hypotheses on economic relationships, leading to a discussion of concepts. Patrick later described this discussion as challenging because the students did not show a commitment to the semantic field of the lesson. Instead, the students continually undermined the emergence of economics as a joint field of attention and engaged in a discussion of peer relations.

In the vignette, Patrick intends the lesson to focus on a discussion of the field of economics, while the students use it for a discussion of peer relations. Patrick’s involvement in these situations is based on his situated appraisal, which makes him focus either on the field of economics or on the students’ discussion of peer relations. In class, several situations force Patrick to engage in situated experimentation because the tacit from-to relations he relies on do not lead to a realization of his intention. In experimentation, Patrick brings different elements of the situation into focal awareness to identify constitutive elements and revises his practice to match the current situation. This experimentation reconfigures the relationship between teaching intentions and strategies—Patrick tacitly develops new from-to relations in professional practice and learns to be pedagogically competent in the situation. The following vignette illustrates a moment in which such a reconfiguration took place.

“Enough Already! Really! Ack! This Is Getting on My Nerves”: The Continuous Opposition of the Semantic Field of the Lesson and the Field of Student Peer Relations

In the following vignette, Patrick’s teaching relates to the semantic field of economics. He wants to explain concepts relevant to economics, such as market, and different market structures. To do this, he presents a PowerPoint slide that introduces several economic concepts: needs, demand, and act of purchase. These concepts are linked to each other in a flowchart, illustrating that a person can experience a need, which has the potential to become a demand to purchase goods at a certain price, leading ultimately to an act of purchase. Patrick has already used the same flowchart in the previous lesson to discuss the first two concepts. In the current lesson, Patrick continues to discuss the concepts introduced in the flowchart by asking, “The act of purchase—where does it take place?” This question initiates a conversation, and students state different places: “in a shop,” “online,” and “at home.” The last statement is taken up by Patrick, who is surprised by the comment but then acknowledges that acts of purchase indeed can take place at home when they are online. This situation is one of many in which Patrick demonstrates that he is not challenged

by student statements that relate to the semantic field of the lesson, even when he has expected different answers. In this situation, Patrick relates student statements to the intended semantic field of economics.

As the lesson advances, Patrick moves on to the next PowerPoint slide, which shows the same concepts but also introduces the term “market.” This slide shows a model that relates the concepts “needs” and “demand” to the concepts “market” and “supply.” Patrick comments on the model and then tells students to write the definition of “market” in their exercise books: “Supply and demand meet on the market. There are different market structures.” Then, he tells the students to read one page in their textbooks and identify key concepts related to the term “market.” After they read the page, Patrick discusses these terms with the students and uses the blackboard to write terms down and draw the relation between supply and demand for three market structures: (1) the competitive market, (2) a monopoly, and (3) an oligopoly (see Figure 2).



Figure 2: The teacher illustrates different market structures on the blackboard.

Patrick then asks the students to write these terms down, together with their respective definitions. While discussing these terms, some students get involved in an argument on the Greek roots of the terms “monopoly” and “oligopoly,” and their meanings. More and more students start to share their ideas and contribute to a lively discussion across the classroom that grows increasingly noisy. This situation is the first instance in which the field of interaction shifts, and students start to discuss their peer relations. The situation unfolds in the following conversation¹ between several students: Ciljeta, Deniz, Feodora, Oana, Pablo, and Wahid (for the students’ location in class, see Figure 3):

Feodora: It is most likely Greek. [Several students comment.]

Teacher: I don't know, Feodora.

└ Pablo: She is right.

Oana [nods]: I agree with Feo.

[Students continue to comment on the matter.]

Teacher: [staccato] I had no Greek. So I can't say anything about it.

Several students: We don't have Greek either.

Teacher: But it means... [Students continue talking, while Feodora and Ciljeta loudly discuss across class.]

└ Ciljeta [to Feodora]: Oka-ay, Feo. [Students continue talking.]

Teacher: [steps away from the blackboard, brings thumb and index finger to the base of his nose] It means in any case...

└ Feodora [to Ciljeta]: Yeah, I apologize.

Ciljeta: Yeah, we got it, it's Greek.

Teacher: In any case, it means... m-a-n-y. [takes his hand off his nose]

Teacher: Alright, now we've said it five times: We got it. We don't have to repeat it another five times. We got it. That's enough.

└ Ciljeta: But I've told Feo personally.

└ Deniz: Yeah, it's enough.

Wahid: Say it one more time, Ciljeta.

Teacher: That's enough, Ciljeta. It's disturbing.

In this situation, the interaction shifts away from the semantic field of economics. Students relate to economics only on a symbolic level, establish a new semantic field that focuses on peer relations, and thus stand in opposition to the semantic field of which Patrick remains focally aware. Patrick reacts to this by shifting his focal awareness, stating, "I had no Greek." This statement acknowledges a lack of knowledge with respect to the Greek language origin of the terms "monopoly" and "oligopoly" and provides a ritual conclusion that aims to return to the intended field of communication: economics. However, the students do not validate Patrick's conclusion but remark that the lack of knowledge is an insufficient reason for ending their discussion. Their focal awareness remains on their peer relations: Oana validates the truth status of Feodora's statement, while Ciljeta says, "Yeah, we got it, it's Greek," and thus presents an alternative ritual conclusion that semantically ratifies the truth claim of Ciljeta's proposition, while the gestalt of her

expression simultaneously rejects the social mode in which the proposition is presented. Ciljeta disapproves of Feodora's behavior because it contributes to the semantic field of the lesson and not to the discussion of peer relations. The discussion of peer relations becomes increasingly prominent in the interaction until Patrick intervenes to reset the focus.

Patrick disapproves of the students' actions by saying, "That's enough," marking that their focal awareness on peer relations lies outside the semantic field of the lesson. His action proposes to exclude the topic of peer relations from interaction. However, Ciljeta does not accept his proposition and again opposes Patrick's conclusion, arguing that her action is not related to the public sphere of teaching and learning.

Implicitly, Ciljeta acknowledges that her focal awareness of peer relations opposes the semantic field of the lesson. In her statement, Ciljeta constructs a difference between the public domain of classroom interaction that has its focus on the topic and a private domain of classroom interaction that may focus on student peer relations. Even the person sitting next to Ciljeta, Deniz, who until this point remained focally aware of peer relations, validates Patrick's conclusion: "Yeah, it's enough." Nevertheless, Wahid encourages the opposition of the students against the semantic field that Patrick is trying to establish, saying, "Say it one more time, Ciljeta." In consequence, Patrick repeats his conclusion, addressing Ciljeta by name: "That's enough, Ciljeta. It's disturbing."

However, Patrick refuses to focally attend to a discussion of peer relations. In the minutes of interaction that follow, students continue to discuss their peer relations through a series of validations and oppositions, using economics as a semantic proxy, without committing themselves to the semantic field of economics. Patrick, forced to attend to peer relations, struggles to relate students' practices to the semantic field of economics and bring the focal awareness of students to the topic of economics. As the lesson progresses, the students repeatedly shift back to the negotiation of peer relations.

After several attempts to shift students' focal awareness through situated experimentation, Patrick expresses his frustration because the students have established an oppositional field of interaction. This oppositional field creates a joint awareness characterized by insults and—more importantly—by turning away from a commitment to explore and discuss economics. This opposition becomes increasingly problematic for Patrick, who intends to foster a discussion of economics as the semantic field of the lesson. The opposition stabilizes over time, and students continue to exchange insults loudly across class, thereby disapproving of each other as peers and preventing the interaction from remaining on topic. Besides these problems, Patrick manages to stop the students' opposition by tasking them to copy the schematic drawing on the blackboard into their exercise books. While the students are busy with the task, Wahid, one of the students, breaks the silence. This marks the moment where Patrick focally attends to the educative problem that he faces:

Teacher: [turns away from the blackboard and towards the class] <[shouting] That's enough!
* Really!> Ack, I have really had enough now. I quietly asked Deniz before to not use words like these. And what do you do? In the middle of a quiet moment, you throw in some insulting terms. Break out of it. * I am not the strictest teacher, but that really gets on my nerves. * How you are talking to each other, how you interact with each other. * That is... ugh... Horrible. Low-wes-st of the low. Break out of it. * At least when I am here. ***
<[breathing out] Phe-ew.> Now I feel alright again.



Figure 3: Videography screenshot, minute 00:24:46: *“That’s enough! * Really!”*

Patrick’s exclamation *“That’s enough!”* focally attends to the insulting terms that the students have used about each other. During the lesson to which this vignette belongs, Deniz called another student an “idiot” and got a warning from Patrick for using this word, which in turn resulted in Burak calling Deniz an “idiot” for making the insult. Shortly afterwards, Oana called Wahid “so stupid,” and Wahid in turn called her a “freak” who should be quiet. More generally, *“That’s enough!”* relates to actions that oppose the joint focal awareness on economics, leading to situations where interaction shifts away from the semantic field of the lesson. This prevents Patrick from presenting economic concepts and discussing them with the students. At the same time, students focally attend to their peer relations instead of showing a commitment to discuss economics. This opposition destabilizes the intended semantic field of the lesson, which itself is a prerequisite for discussing economic concepts.

Patrick also elaborates on the reasons for his exclamation. Until Wahid’s last insult, the students focused on the task, copying the schematic drawings on the blackboard into their exercise books in relative silence (Fig. 2). Through his exclamation, Patrick clarifies a rule: insults should not be part of teaching and learning interaction. He justifies this rule by stating that he is “not the strictest teacher,” acknowledging that his teaching also allows an amount of play beyond a focus on the subject. Implicitly, he also states that play is acceptable in teaching and learning situations if it does not refocus the interaction on semantic fields other than the lesson topic.

His statement “at least when I am here” limits this rule to the time of lessons, when he is part of the interaction. Here, he implicitly demonstrates the difference between the focus on a topic during lessons and a focus on peer relationships outside lessons. The statement also indicates his didactical intention to make economics the semantic field of interaction. After expressing his irritation with the situation, Patrick concludes by asking, “Did my message get through?” He wants students to focus on the topic of the lesson instead of focusing on peer relationships. This vignette is typical for the educative problem that Patrick faces. Throughout the lessons that we observed, students spent significant amounts of time negotiating peer relations, which continually impeded focal awareness on the topic of these lessons.

To summarize, the teacher involved in this situation relies on tacit knowing in interaction with students, using student comments related to the semantic field of the lesson to guide focal awareness of students

and requesting their commitment to teaching and learning. He also reacts to students who destabilize this focal awareness and asks them to commit their focal attention to the lesson topic. He expresses his irritation when students pay attention to objects outside the intended semantic field and when they shift their focal awareness to such objects. Our analysis shows that such shifts undermine joint attention to the object of the lesson, a state of interaction where students and teacher focally attend to the same object and thus come to share the same goals. In such a state, teacher and students develop joint focal awareness in which they share the commitment to help each other achieve an intended goal. In our case study, we identified the maintenance of students' focal awareness as one central element of pedagogical competence. From a pedagogical perspective, this maintenance of focal awareness requires a commitment to a joint intentional object. However, our case study illustrates that a significant number of students do not enter such a commitment and instead continually oppose teachers' efforts to guide focal awareness towards the lesson topic. The students' focal awareness remains on peer relations, which conflicts with the semantic field of the lesson. Ultimately, the teacher is not able to establish a joint focal awareness on the lesson topic. From a Polanyian perspective, such a situation requires situated experimentation and focal attention to the conflict.

Conclusion

Our analysis illustrates how a teacher organizes classroom interaction by validating student actions and elaborating on them when they relate to the intended topic. We showed that the teacher was not challenged by student actions related to the topic of the lesson, indicating that didactical aspects of teaching remained unproblematic for him. Even when student statements were not factually correct, the teacher had no problems relating them to the semantic field of the lesson. Here, the teacher tacitly integrated subsidiary cues from student actions into the object of his focal awareness, economics, and continued teaching with an orientation that focused on presenting and elaborating on the topic. Throughout the lessons, we found numerous situations in which the teacher became subsidiarily aware of student actions that related to the lesson topic, which enabled him to validate, elaborate on, or oppose these actions without having to focally attend to them. In these situations, teaching practice remained unproblematic: his focal awareness remained on the topic that he intended to teach—economics. However, our analysis illustrates that the teacher had difficulties in situations where he was forced to relate to another, opposing field of orientations that disrupted the semantic field of the lesson and required experimentation.

From a Polanyian perspective, interactions that require teachers to engage in experimentation provide the potential for the development of pedagogical competence. In our vignette, the teacher's experimentation focused on the semantic field of peer relations, an educative aspect of teaching. This semantic field stands in opposition to the semantic field of economics on which the teacher focuses. Here, the situation forces the teacher to shift away from the didactical orientation of presenting and discussing the topic because this orientation does not lead to a procedural activity to which students commit. In this situation, the teacher focally attended to the discussion of peer relations, which he had to consider in pursuit of his intended aim of teaching. However, the subsequent interaction illustrates that the teacher shifted his focal attention back to the lesson topic instead of focally attending to the students' peer relations. Our analysis indicates that the unstable peer relations of students constitute a semantic field of attention that impedes a commitment to the lesson topic.

The vignette illustrates that the situation requires the teacher to attend to two semantic fields, which reflect in two aspects of pedagogical competence: First is the field of economics, which relates the presented

content to the knowledge of students. From a pedagogical point of view, this field requires a *didactical* orientation. Second is the field of peer relations, which relates to teaching and learning only indirectly and focuses on care work and the development of social relations that enable collaboration for learning. From a pedagogical point of view, this field requires an *educative* orientation.

With respect to competence development, our analysis shows that the teacher maintains a didactical orientation throughout the interaction. This didactical orientation does not allow him to move from the current situation to his intended aim of teaching, which forces him to experiment with the situation and find new from-to knowing that will allow him to address the problem. One way to resolve the problem is to foster peer relations. We argued that the educative task of fostering peer relations needs to be brought into focal awareness to resolve the ongoing conflicts in class and establish collaboration for learning. Based on the vignette and further analysis of our data, we argue that the development of pedagogical competence involves at least two fields: a didactical field that relates to teaching and learning and an educative field that relates to peer relations. In our case study, the teacher remained focally aware of the didactical field of interaction and did not shift his focal awareness to the educative field of student peer relations. From a Polanyian perspective, the situation would require the teacher to focally attend to students' peer relations in order to develop from-to knowing that would accommodate the educative aspects of teaching.

ENDNOTE

¹Our empirical analysis relies on a partiture transcription that uses the following conventions: Loud speech is underlined, e.g., “Teacher: That’s enough!” Refraining from a speech act is marked with ..., e.g., “Teacher: That is... ugh... Horrible.” A pause in speech acts lasting up to five seconds is marked by * (one * per second). Lengthened speech is marked by a hyphen, e.g., “Ciljeta: Oka-ay, Feo.” An overlap in speech is marked by ^L at the position where another person starts their speech act. Nonverbal actions are described in squared brackets, e.g., “Oana [nods]: I agree.” Nonverbal actions accompanying speech acts are marked by angle brackets, e.g., “Teacher: <[shouting] That’s enough! * Really!>.”

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