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A Three-Dimensional Account of Teacher–Student Communication: An Account and Its Application

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Abstract

Objective of the Article: The article develops a potentially comprehensive and philosophically informed model of classroom communication—which is called three-dimensional—as well as to test its plausibility by conducting tentative empirical research.

Research Method: We draw on the hypothetico-deductive inquiry model (following Popper's concept), according to which the research starts as a response to a problematic situation (*P1*) and assumes the form of a tentative theory (*TT*) to be tested empirically. If it is not refuted, it can be accepted as binding and its errors (*EE*) can be eliminated. In case it is falsified, a new problematic situation (*P2*) appears. The empirical part of theory testing is based on the technique of observation and the analysis of teachers' utterances.

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A Short Description of the Context of the Presented Issue: We introduce the concept of three-dimensional communication in education, which involves (1) the transmissive dimension, where the teacher provides information and students receive it; (2) the constitutive dimension, which promotes social bonds in the classroom; and (3) the interpersonal dimension, which includes individualization in communication and teaching and helps build the teacher–pupil relationship. Then, the empirical part of the article presents the model being applied in research conducted in an elementary school in the Lower Silesia region of Poland.

Research Findings: It is claimed that this model can be used as a reference for analyzing actual communication processes, which is shown by the example of the empirical part.

Conclusions and Recommendations: The plausibility test of the theory succeeded. However, questions are raised for further exploration: the *normativity* of such a model, its context-sensitiveness, its referring to schools with student-centered and teacher-centered education, the effectiveness of a teacher's communication within the three dimensions (which may vary), and different teaching styles being referred to advanced three-dimensional communication between teachers and students

***Keywords*:** communication, three-dimensional model of communicating, individualization in communication, teacher–student communication

Introduction

Communicating with others is one of the most essential skills to be mastered by a person living in society and taking part in shared activities and daily interactions. However, it seems that no convincing, exhaustive explanation of communication has been provided, despite the multitude of competing solutions presented so far (Dance, 1970; Hetmański, 2015; Kulczycki, 2012a; Moreale et al., 2007). In the literature, one can find numerous studies on communication that have emerged from various disciplines (Kulczycki, 2012a, pp. 15–16). On the other hand, communication itself is considered the primary, fundamental factor through which we can

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comprehend various sociological, psychological, or economic factors. This perspective assumes that communication is a social relationship that cannot be reduced solely to the mental states of the individuals involved or other sociological, biological, or cybernetic factors (Kulczycki, 2012a, p. 16).

In this article, we accept the view that communication has a primary and intrinsically irreducible character. We also acknowledge that it is not possible to provide a cross-disciplinary, unifying definition of communication. However, we believe that presenting particular, field-specific models is feasible and can be practically valuable. Therefore, we provide an account that we call a *three-dimensional model*, which is specifically applicable to educational (i.e., teacher–student) communication. This model comprises the transmissive, constitutive, and interpersonal communication dimensions. Additionally, we test how it can be empirically employed when observing and analyzing classroom communication.

Methods and Materials

The methodological strategy employed in this research involves proposing a theoretical, predominantly philosophical, explanation of communication. Subsequently, this explanation is applied within the pedagogical context of the classroom. The final step involves empirically testing or demonstrating how this explanation works in a specific context. An example of this research was conducted in an elementary school in the Lower Silesia region of Poland. Therefore, from a methodological perspective, this research is not based on induction. It does not develop the theoretical explanation solely based on empirical findings (see Ajdukiewicz, 1974, pp. 285–337; Babbie, 2014, pp. 127–162). Instead, our strategy is closer to the hypothetico-deductive inquiry model (formulated by Popper), with a primary focus on the empirical sciences (see Popper, 1972). According to this model, the research starts as a response to a problematic situation (*P1*) and assumes the form of a tentative theory (*TT*) to be empirically tested for its logically ("deductively") drawn consequences. If it is not refuted, it can be accepted as binding; at the same

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time, it is possible to eliminate its errors (*EE*). In case it is refuted (or "falsified" in stricter Popperian terminology), a new problematic situation (*P2*) appears—in response to which a new tentative theory is sought (Popper, 1972, pp. 119, 164–165).

The problematic situation that has motivated our research is the need for a theoretical, comprehensive account of teacher–student communication. This account should synthesize the main features of its philosophical bases and, more specifically, pedagogical reflection about classroom communication. In response to this need, we propose a hypothesis ("a tentative theory") called *the three-dimensional view of communication*. Through literature studies and conceptual analysis, we then analyze and assess this hypothesis. The empirical part of the research, which is regarded as a test of its consequences, will demonstrate how it can be employed and lead to the conclusion that the proposed account is valid and valuable. However, further testing is still necessary. The potential perspectives for its further elaboration and application are outlined in the Discussion section.

The empirical research consisted of 70 openly observed lessons conducted in an elementary school in Poland, specifically in Lower Silesia. Thirty-five hours of observations were conducted in 1st–3rd grade classes (integrated education) and 35 hours in 4th–8th grade classes (subject-based teaching). The lessons were led by a total of 10 teachers: five 1st–3rd grade teachers (coded as T1–T5) and five from 4th–8th grades (T6–T10). All of the teachers were women, as the teaching profession in Polish elementary schools is predominantly female. The observations were conducted over a span of 60 days, from January to March 2020 and then from March to June 2021. The COVID-19 pandemic caused an interruption, but no distance learning was observed during this time. The observed classes consisted of 18 to 27 children, whose ages ranged from 7 to 15 years, depending on which grade they were in. The groups were culturally uniform: they consisted of Polish students living in small towns (of about 5,000 inhabitants) and the surrounding countryside.

The observation was conducted using an observation sheet; it focused on the teachers' methods of communicating with the students. The goal

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was to assess whether and how the theoretical three-dimensional model of communication is reflected in their teaching practices. The observation sheet primarily included questions about the teachers' speech acts or communication, such as how they begin and end the lesson, how they address the students, how they provide feedback, what questions they ask students, and the topics of those questions (e.g., the subject being taught, classroom dynamics, or specific student issues). The utterances were recorded on the observation sheet and, in some cases, with the teachers' consent, the lessons were recorded on a voice recorder and transcribed manually in a traditional manner (see Kvale, 2007, pp. 92–100). In addition to the observations, the researcher made notes in their notebook regarding the context of the learning situation, the subject being taught, and the theme of the particular lesson.

Three-Dimensional Account of Communication

According to the etymology of the word *communication*, the term stems from the Latin noun *communicatio*, which may be translated both as "imparting" and as "making common" (Perseus Digital Library, 2023). The verb *communicate*—which comes from the Latin *communicare*—means "to impart" and "to discuss," but also "to divide with" or "to share" (Perseus Digital Library, 2023; Online Latin Dictionary, 2023). The cognates of *communication* are words such as *common* (i.e., shared) and *community* (i.e., society). It can therefore be assumed that "the meanings of these words are closely intertwined … communication and communication as an instrument are used to create a community, and the basis for both is common" (Hetmański, 2015, pp. 87–88; Młynek, 2015, p. 9). It appears that, in addition to transmitting information, there is another equally important aspect of communication which serves to build and sustain community, nurture daily rituals (such as schooling), maintain bonds between members, and guarantee participation in a common activity. The first aspect, referred to as *transmissive*, was emphasized in the 20th century by thinkers such as Shannon (1948), Weaver (Shannon & Weaver, 1964),

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and Dretske (1988). An emphasis on the second aspect of communication can be found in the writings of philosophers such as John L. Austin (1962), John Searle (1969, 1997), the late Ludwig Wittgenstein (2009), and partially Jürgen Habermas (1985a, 1985b). This perspective can be called *constitutive* (see Młynek, 2015, p. 53).

However, apart from the two dimensions explicitly stressed in the etymology, there is also an implicitly embedded dimension: the psychological aspect of communication, which involves an individual approach to a speaker. This can be referred to as the *interpersonal communication* dimension, which is discussed by Berger (2008), McCroskey et al. (2002), Ekron (2015), McKey et al. (2009), Stewart (2011), and Majewska-Opiełka (2015). In our view, these three dimensions might relate to the pedagogical background, as noted by Kupisiewicz et al. (2018), who stated that communication has "important cognitive, social, psychological, and pedagogical functions" (p. 82). Here, the cognitive function is aligned with the transmissive dimension, the social function with the constitutive dimension, and the psychological and pedagogical functions with interpersonal communication.

The *transmissive* understanding of communication accentuates the process that serves our conveying (transmitting): information, knowledge, ideas, etc. The sources of such an approach in the 20th century can be traced back to research conducted by Shannon, who first published in 1948 an article called *A Mathematical Theory of Communication* (Shannon, 1948; see also Wiener, 1961). The approach draws on mathematical models and may be interpreted as "the transmission of encoded and then decoded information" (Młynek, 2015, p. 53). It consists of the six following constituents: a source, a transmitter, a channel, a receiver, a destination, and noise (Shannon, 1948). This process is supposed to proceed linearly, with the final success depending, among other things, on reducing or minimizing noise and correctly decoding the transmitted content.

The proponents of the transmissive account referred to metaphors such as "moving," "transferring," "transporting," or "sending" and is sometimes called a "telegraphic," "transport," or "hydraulic" view of communication (Kulczycki, 2012b, p. 22; Peters, 2006, p. 84). Therefore, the core concept

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is "any form of exchange of information by means of signs between living beings (humans or animals), as well as between humans and machines" (Polański, 1999, p. 306). In the educational context, the transmissive aspect is primarily manifested in the teacher's adherence to the curriculum, specifically in the transmission of knowledge to the pupils.

The *constitutive* aspect of communication can be distinguished from the transmissive aspect. While it can be assumed that the transmission models of communication are rather similar, the situation is different for those adhering to the constitutive understanding of communication. This is since these researchers have generally belonged to different strands and schools of research. Among the "classics" of such an approach is John L. Austin, who emphasized not only locutionary speech acts, but also illocutionary and perlocutionary ones—which also have an essential and effective impact on social reality. Additionally, Austin discussed performative acts, which create and sustain a new social reality (1962; see Oishi, 2006). Thus, to Austin, language can play many different roles apart from stating facts and transmitting information about them. This constitutive role of language is even more evident in the writings of John Searle, Austin's student and follower, who claimed that

> language is the fundamental human institution in the sense that other institutions, such as money, government, private property, marriage, and games, require language, or at least language-like forms of symbolism, in a way that language does not require the other institutions for its existence. (Searle, 1999, p. 153)

In his view, language underlies all of our practices. Therefore, through linguistic practices, our social world and communal life can be formed, fostered, and changed.

In school, these rituals may be carried out through regularly repeated actions that are "rich in meaning and poor in message" (Peters, 2006, p. 86). One example of such a ritual is the daily greeting between teachers and students, which includes checking attendance, assigning and reviewing homework, grading students, reminding them of school rules,

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assigning chores, preparing occasional performances, and organizing school assemblies or class events (e.g., on the occasion of Boys' Day, Women's Day, Children's Day, or National Education Day). To some extent, this aligns with the perspective that Michał Wendland referred to as "communicative constructivism," which suggests that the human construction of the world primarily occurs through interpersonal acts such as linguistic communication (Wendland, 2011, pp. 21–29). In turn, these constructed practices are upheld by the school's predictable routines and rules—which shape habitual patterns of activity (see Giddens, 2001, pp. 50–51).

It seems that the view of communication as dancing, as metaphorically described by Robert Brandom in his concept of *inferentialism* (Brandom, 1998), also includes the constitutional dimension of communication—even though he primarily emphasizes the semantic and cognitive aspects of conversation. While the "game of giving and asking for reasons" is central to his understanding of linguistic practice, communication is not just about transmitting semantic content.

> Conversational partners should not be pictured as marching in step, like soldiers on parade, but more as ballroom dancers, each making different movements (at any moment, one leads and the other follows, one moves forward and the other back, one sways left, the other right, and so on) and *thereby* sharing a dance that is constituted precisely by the coordination of their individually different movements. Understanding—whether one-sided understanding of another or mutual understanding of each other—is a product of discursive co-ordination in which the distinctness of perspectives is maintained and managed. What is 'shared' in such a process is in principle not specifiable except by reference to the various perspectives from which it can appear. (Brandom, 2000, p. 383)

It is worth noting that an analogous situation seems to exist in the case of mutual cooperation between teacher and student, where such a communicative dance takes place, with the teacher typically being the more skillful interlocutor-dancer. Their perspective is broader in terms

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of experience, knowledge, and the command of the didactic process itself. On the other hand, the student, operating on a different level, typically has a narrower perspective. Admittedly, the student makes simpler and more limited movements while acquiring knowledge, but the teacher leads the "dance" by navigating between different perspectives, ultimately making the student's perspective more comprehensive. However, this can only happen through common practice—not only construed in purely linguistic terms, but also rooted in ordinary school life, with all its rituals and social activities.

Brandom's metaphor can lead us to the interpersonal dimension of communication, which involves the dual communication between a teacher and an individual student. From a strictly logical perspective, in terms of systematization, this dimension might be included in the constitutive one since it favors building social ties through psychologically adequate messages. However, in an educational context, it should be distinguished as separate due to its significance in the process of individuation in communication and education. This individuation should be understood as adopting a form of communication appropriate to the learner's needs. More specifically, it should consist of the teacher adapting their message to the individual child, paying attention to the child's character traits, knowledge, or cultural capital, for instance – as these factors affect the student's performance. In line with this, interpersonal communication is understood as relationship-making (Stewart, 2011, pp. 14–56), which indicates that every act of communication is a process of establishing or defining a relationship with others. We all live in a variety of relationships with others that are created, maintained, and dissolved through communication (Morreale et al., 2007, p. 158; see also Gadamer, 1997).

Consequently, individualization in teacher–student communication is essential in the educational environment, as it places significant emphasis on the diversity of individuals and their unique needs. The concept of student-centered teaching within the organized education system is closely related to John Dewey and the broader New Education Movement (or Educational Progressivism). It was based on the ideas

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of progressive educational reform, which aimed to transform how we think about the educational process. The fundamental assumption of this concept was the belief that educational praxis, in order to meet the individual students' needs, should include their active participation in the learning process (Dewey, 2001, p. 54). Indeed, Dewey believed that the traditional model of teaching, which focused on the unilateral transmission of knowledge by the teacher, was inappropriate because it failed to take into account not only the needs of the child, but also—ultimately—the needs of society, which was intended to be built by those who were then children and would become adults. Instead, Dewey advocated for interactive education, where the students would be active participants, engaging in hands-on experiences and experimentation to gain a deeper understanding of the world (see also Purkey, 1992; Rogers, 1961).

The more specific account of individualization in learning—which may also be connected with teachers' utterances—is set out by Neumann under the label of "student-centeredness" (Neumann, 2013). It advances the view that learning is directed at three contexts that are focused on what happens *in* students, *on* students, and *with* students (2013, pp. 164). The differences between them are summed up in the following passage.

> Who selects the content to be studied? In contexts centered *in* students, students select the content; in contexts centered *on* students, educators select the content; and in contexts centered *with* students, teachers and students collaboratively select the content. This simple distinction makes all the difference. (2013, p. 171)

The aspects of individualization mentioned above appear to manifest themselves in the language used by teachers. Therefore, the specific aspects of student-centeredness are believed to be reflected and identifiable in their language choices.

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Three-Dimensional Model: Empirical Exemplifications

The research indicated that the three dimensions of communication, as outlined in the model described above, are evident in the language used by teachers. Consequently, this language serves various purposes, including transmitting knowledge, fostering a sense of community within the school, and cultivating relationships between teachers and students, all while considering the individual needs and interests of the students.

Transmission Dimension

During the observed lessons, it was noted that the majority of teachers' time was dedicated to the one-way conveyance of knowledge. This indicates that the teachers' communication primarily revolved around the transmission dimension. This is illustrated by the following examples:

> In the 1st century AD, Rome boasted a population of over a million inhabitants. The Romans, perceiving the power of their city as immense, bestowed upon Rome the epithet of the Eternal City. Concurrently, the economy of the Roman Empire relied heavily on the labor of slaves. Those who found themselves enslaved in Rome included prisoners of war and debtors who were unable to repay their debts, among others.
> (T6, a History lesson for the 5th grade: "The society of ancient Rome")

> Kakadu National Park is the largest national park in Australia. It is located in its northern part. There, you can encounter crocodiles living in the rivers. You can also explore eucalyptus forests and waterfalls in the park. Intermittent rivers, which form after heavy rains and dry up during droughts, are also present there.
> (T8, a Geography lesson for the 7th grade: "Amazing places in the world")

The above examples illustrate the transmission dimension undisturbed by any disruptions. This dimension is essentially predictable and unidirectional, with the conveyance of knowledge flowing from the teacher to the students. The teachers position themselves as the sole holders of

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knowledge, depositing it into the passive students. This process is reminiscent of what Paulo Freire famously termed the "banking concept of education" in his (now classic) book, *Pedagogy of the Oppressed* (Freire, 2005, p. 72).

In the younger grades, in order to maintain attention, the teachers vary the intonation of their voice and adjust their vocabulary to suit the children's age. However, their communication remains rooted in a one-way deposition of knowledge, from the teacher to the pupils. This is exemplified below.

> Frogs are amphibians, but interestingly, they do not drink water; instead, they absorb it through their skin. They live only in freshwater; that is, they do not inhabit oceans and seas. The largest frog is called the Goliath Frog, the shy and elusive goliath, which can weigh up to three kilograms! And now I will show you frogs and other amphibians. See what they look like; they are amazing! Have you ever seen such frogs? […] And have any of you, my honeybuns, seen such a toad? […] I'm about to show you on the board how you can draw a frog. Then, you will draw it in your notebooks and sign the drawing […]. Do the sketch first in pencil; only later, color with crayons. Remember not to go beyond the lines; draw with pencils, only one way, so that it's nice and try to draw very accurately, leaving as few white spots as possible. […] Matthew, can you divide the word "frog" into syllables and spell it out? Okay, I'll write it for you on the board now, and you can nicely rewrite it in your notebook under the drawing of the frog.
>
> (T1, a Nature Education lesson within the integrated education system: "The world of amphibians")

The teacher directs the entire process that occurs in the lesson, gives precise instructions for drawing a frog, and warns against undesirable behavior ("I'm about to show you [on the board] how you can draw a frog. Do the sketch first in pencil, only later, color with crayons. Remember not to go beyond the lines […] only one way […] leave as few white spots as possible"). Her language is full of precepts, prohibitions, and commands that must be complied with.

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Also noticeable in this example is a much closer relationship with the children (*my honeybuns*), which is because in 1st to 3rd grades, one teacher spends several hours a day with one class at a time. In follow-up questions, the teacher checks that the students have correctly decoded the content she is "sending."

Sometimes, unexpected disruptions in communication occur during the transmission of knowledge, but after the troublesome situation is managed, the transmission returns to its daily track. This happens in the following example.

> As we already know, a verb is a different part of speech, just like, for example, a noun, an adjective, or a numeral. A verb answers the following questions: What does he/she/it do? What is happening to her/him/it? What state is it in? It is conjugated by persons, numbers, tenses, gender, and/or modes. We distinguish between the passive and active and reflexive voices of verbs. Verbs come in personal and non-personal forms. […] Martynka, what happened? Are you feeling unwell? […] Now, please solve the exercises from page 14; for now, exercises 1 and 2.
> (T7, a Polish language lesson for the 4th grade: "The inflected parts of speech: A review")

There was a disruption during the teacher's transmission of knowledge, as one of the students reported feeling unwell. After attending to the student (a form of "noise reduction" in the transmission model), the teacher resumed the transmission.

Constitutive Dimension

Despite the fact that the transmission dimension is dominant, it should be noted that messages from the teacher also reinforce school routines and rituals (Giddens, 1984, p. 50–51). Activities such as checking attendance during lessons, assigning homework, introducing new topics, and giving assignments largely constitute these daily school routines. Similarly, celebrating holidays, birthdays, and school events collectively are considered school rituals. The following examples illustrate this.

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> I'll take attendance: Kasia, Ania, Nicholas, Sebastian […]. Well, today—fortunately—only two people are absent. Valentine's Day is coming up soon, and we need to prepare a Valentine's Day school newspaper for our classroom. Please bring the materials needed for this by the end of this week, such as cut-out colorful hearts, etc. […]. Additionally, there will be a Valentine's Day Post Office and a Valentine's Day Fair at school, where you'll be able to send a Valentine's wish and purchase cards that other students have prepared. There will also be lollipops and other candies available. […] Now, let's move on to check the homework.
> (T9, a Math lesson for the 4th grade: "Review of section one")

> Today, 20 minutes before the end of the lesson, we'll go to the school assembly held in the gym. The performance for the assembly was prepared by the 5th-grade A group to celebrate the first day of spring. Additionally, there will be various games and a sports tournament for you in the gym.
> (T2, Polish language education for the 3rd grade (integrated): "The first day of spring")

Routine plays a vital role in everyday school life because it provides a sense of stability and predictability with its familiar sequence of individual activities. However, students agreeing to such daily routines may feel trapped in a repetitive school pattern. Teachers' language and their messages concerning school life reinforce a sense of community, which may persist throughout the school year. At the beginning of the school year, students are acquainted with the grading system for each subject and the school. They are also presented with the school statute, various school regulations, the school's work schedule, and the calendar of school events and competitions. The school's method of informing students about the rules strengthens the school's constitutive dimension.

As the constitutive aspect of communication is seen as pervasive in human linguistic relationships and as maintaining those relationships, it encompasses various speech acts: greetings, salutations, goodbyes, or small talk between teachers and students during lessons. It consists

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of many expressions and phrases, such as "Good morning! Welcome to our next lesson,""Goodbye, see you tomorrow!""Nice to see you again!" and "See you after the weekend!" (almost every observed lesson); "What's up with you guys?" (T3, 4, 7); "How are you doing today, my little sweethearts?" (T3); "How are you feeling today?" (T7); "You guys seem kinda tired today—maybe it's because of the weather?" (T8); "Nice weather today. It's worth going for a walk after school" (T6); "But it's hot today, drink lots of water!" (T4).

Interpersonal Dimension with Individualization in the Communication Process

The prevailing one-way transmission of messages on the part of the teacher, although rooted in routines and rituals, may suggest that the interpersonal dimension at the school is rather limited. Indeed, based on observed lessons at the school across all grades, the interpersonal dimension was not often apparent in the teacher's interactions with the whole class. It is likely that this lack is due to the teachers' chosen learning style for the students, or alternatively, it may be attributed to the school's teacher-centered approach.

In the 4th through 8th grades, subject-based teaching is implemented, meaning that the students have daily lessons with several teachers in different classrooms. Some teachers see their students only once or twice a week (e.g., in the case of Geography or History), while others see them on a daily basis (e.g., in the case of Mathematics or Polish). The examples of individualization were primarily observed in the latter.

The interpersonal dimension, considering students' learning styles and opportunities for free self-expression, occurred during a Polish lesson for the 6th grade. At the end of the lesson, the teacher gave the students the following task.

> For homework, please prepare a presentation of your favorite book. You can describe the book, create illustrations, and discuss it. Additionally, you may create a multimedia presentation or, if you prefer, work together in groups to develop a short theatrical scene based

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> on the book. I am counting on your creativity, so feel free to choose the method that suits you best. I'm already curious about the results of your work!
> (T7, a Polish lesson for the 6th grade: "How to write a short story")

Most often, however, the interpersonal dimension took the form of a single message directed to a single student who was presumed to have either a special gift, interest, or some learning difficulty. Sometimes, it occurred in unexpected situations that the teacher sought to address and integrate into their instructional practices.

During a Math lesson for the 8th grade, the teacher, taking into account a student's mathematical aptitude, addressed him as follows:

> Matt, I have prepared additional, slightly more challenging tasks for you so that you won't get bored. Once you've solved all of them, you can choose two to present to the class in a future lesson. Similar tasks may also appear in the next math competition, so it's good practice for us.
> (T10, a Math lesson for the 8th grade: "Solving equations with a single unknown")

In the 4th–8th grades, there was individualization concerning students (usually two or three in each observed class) with special educational needs, as indicated by a report from the Psychological and Pedagogical Counseling Center. Other students were also engaged through general inquiries, such as checking whether everything was understood, if anyone had questions, if anyone needed further explanation, and if it was possible to move on to the next task, etc. However, these questions were typically addressed to the whole class.

In one of the 5th-grade classes, there was also a girl with autism spectrum disorder who sat at a bench together with a support teacher. This teacher assisted the girl with her work and ensured her emotional well-being. Consequently, the teachers conducting the lessons felt somewhat relieved from the need to provide special care for her.

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In the 1st–3rd grades, integrated teaching is led by a single teacher who conducts most lessons (only foreign language, PE, and IT lessons are led by other teachers). Individualization was observed in this setting. After assigning exercises, the teachers approached each student in turn, checking on their progress and providing assistance as needed. Gifted students were given additional tasks without waiting for others to catch up. Although the communications were directed at individual students, they often consisted of standard questions about understanding the tasks or having any questions for the teacher, etc. Only in some cases was the communication tailored to a specific student's circumstances or abilities. One example was a situation during a PE lesson for the 2nd grade, where the teacher communicated in the following way:

> Victoria, you have just recovered from a knee injury. You will only do some of the exercises in class today. If your knee hurts again, please report it to me in advance. You need to rest it.
> (T3, a PE lesson for the 2nd grade)

However, learning based on the students' initiative was not identified. The observed lessons did not draw upon children's experiences and interests. Individualization primarily involved teachers adapting their messages to match students' skill levels and cognitive capabilities. In these cases, the context was student-centered, but specifically, it was centered on teachers selecting the content to be learned and creating "activities that lead students to predetermined goals" (Neumann 2013, pp. 166).

Joint Dimensions of Communication

The aforementioned communication from teachers was regarded as representing one dimension of communication. However, it was mostly distinct from other communication in the school, even if they followed one after the other. Nevertheless, there were also situations in which the dimensions intermingled and complemented each other. This can be observed in the following example.

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> Today, we'll begin the lesson with a review of what we've covered in the last three lessons, focusing on the inflectional and non-inflectional parts of speech, among other topics. Anna and Kacper, since you were absent last week, you won't be asked questions today; please make sure to catch up at home. Everyone, please remember that after Polish class today, we have a meeting to discuss plans for organizing Talent Day. Now, Michael, can you name all the inflectional parts of speech?
> (T7, a Polish lesson for the 6th grade: "Inflectional and noninflectional parts of speech—Exercises")

It was also observed during a Music lesson:

> The whole note is divided into two half notes. […] Additionally, I have prepared a song about winter for you. You need to learn it for a grade, but if any of you don't enjoy singing, you may simply learn the lyrics of the song well and recite it. Alternatively, you may sing the song in pairs. You can pair up after the lesson. However, you may also choose to sing individually. How would you prefer to do it?
> (T10, a Music lesson for the 4th grade: "The rhythmic values of notes")

In these examples, the transmissive dimension, characterized by the repetition of information about the parts of speech or learning a song by heart, is dominant. However, it is enriched by the interpersonal dimension, as seen in the consideration of absent pupils and the accommodation of the children's preferences for mastering the material. The constitutive dimension, as observed in the first example regarding the organization of Talent Day, merely interjects the main thematic line of the lesson.

Concluding Remarks: The Perspectives of Further Exploration

The aim of the article was to develop a potentially comprehensive and philosophically informed model of classroom communication and to test it by conducting tentative empirical research. This methodological

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approach was inspired by Karl Popper's hypothetico-deductive model of theory formation within a field of rational activity (Popper, 1972, pp. 164–165). Based on our research, the plausibility test tentatively succeeded, suggesting that it could serve as an overarching framework for analyzing teacher–student communication. However, considering its rudimentary and general nature, the prospects for further exploration need to be discussed. The first pressing issue concerns the *normativity* of such a model: when viewing a class as a small community composed of diverse individuals, the question arises whether any correct balance between the three dimensions can be established, and what the divisions between them should entail. Secondly, does the balance in question differ depending on various class situations, such as students' age or the difference between integrated and subject-based teaching? Does it need to, or should it, change based on the number of pupils in the class (in our research, the number of pupils in each class was comparable)? Furthermore, how does it depend on the cultural and linguistic backgrounds of the students and the presence of special needs among them (in our research, the classes were culturally homogeneous, but this would have been different if conducted after the Russian invasion of Ukraine in 2022, which resulted in a significant increase in Ukrainian immigrants in Polish schools)? Thirdly, in what ways has the COVID-19 pandemic altered the communication patterns in our school? The fourth, *empirical* issue pertains to the differences in teacher–student communication between schools with student-centered and teacher-centered education. The fifth concern, also empirical, revolves around the effectiveness of teacher's communications within the three dimensions, which may vary in efficiency. This would also involve analyzing the students' reactions and responses to the teachers' remarks. The sixth and final question is *theoretical* in nature, characterizing or supplementing accounts of different teaching styles in terms of the variations in communication between teachers and students. Additional perspectives may emerge during further research.

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Research Ethics Statement

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