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Emine Kılavuz,
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University of Vienna, Austria
Carla Andrea Villagran,
Centro Nacional Patagónico, Argentina

*CORRESPONDENCE

Sarah Nell-Müller
✉ nell-mueller@uni-mainz.de

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Student perspectives on German classroom contexts in processes of transformation. A qualitative-reconstructive analysis of two student drawings

Sarah Nell-Müller*

Institute of Education, School Pedagogy Research Group, Johannes Gutenberg University Mainz, Mainz, Germany

Introduction: This study examines transformation processes in German secondary education, characterized by the increasing integration of digital technologies and a growing emphasis on individualized and self-regulated learning. While existing research has predominantly focused on organizational and instructional development, little is known about how students themselves perceive and interpret these changes with regard to shifting social practices of classroom instruction.

Methods: The study adopts a qualitative reconstructive approach grounded in objective hermeneutics and focuses on the latent level of meaning. Empirically, it is based on a comparative analysis of two student drawings collected at two neighboring schools with differing pedagogical orientations.

Results: The reconstruction reveals students' subjective appropriation of the classroom space and the social practices embedded within it, showing in both drawings a parallel presence of (potentially) transforming instructional orders. In the conventional context, this appears as a contrastive frame of reference that articulates students' desires for new learning and action spaces, whereas in the reform-oriented context it emerges as an expression of disorientation in dealing with changing normative expectations.

Discussion: The findings suggest that transformation processes do not merely establish new forms of learning but initially unsettle existing orders, thereby triggering processes of negotiation over valid practices. In particular, the coexistence of different instructional orders proves to be a key factor requiring students to engage in orientation work. This points to the need to conceptualize educational transformation as a socially embedded transitional process and to design it pedagogically in ways that provide orientation and continuity for learners.

KEYWORDS

classroom practices, educational transformation, objective hermeneutics, self-regulated learning, student perspectives

1 Transformation processes in German secondary education

In the context of German schooling, two major tendencies can be observed in connection with efforts toward school development: on the one hand, digitalization is being advanced, particularly in teaching. Tablets are increasingly used as a substitute for analog textbooks or workbooks and are used for presentations, visualizations, and research. On the other hand, schools are increasingly responding to demands for more individualized and self-regulated instructional approaches (Ehlers, 2013). Both developments go hand in hand: the growing establishment of digital media in regular school settings in recent years (Federal Ministry of Education and Research [BMBF], 2024; Wohlfart and Wagner, 2022) has simultaneously opened up more flexible possibilities for designing individual learning processes (Aufenanger, 2020).

To advance reform processes in the German school context, particularly with regard to digital developments, various federal states have initiated school development programs. Within these frameworks, schools cooperate with one another, test new pedagogical concepts, and receive corresponding support¹. In Rhineland-Palatinate, the initiative “Schule der Zukunft” [School of the Future] has been in place since 2022. The aim of the program is to support schools in developing future-oriented forms of teaching and learning and to provide them with scope for experimenting with new pedagogical concepts. The program is explicitly designed as a bottom-up initiative: with as few specifications as possible from the ministry, innovation projects initiated within schools are developed and implemented. Individual schools develop their own concepts, test new forms of instruction, and exchange their experiences within networks. They are supported in this process by the Ministry of Education of Rhineland-Palatinate, the Supervisory and Service Directorate, and the Pedagogical State Institute.

In practice, this leads to schools within a region working with, in some cases, markedly different pedagogical approaches and learning settings. While some schools comprehensively align their instructional organization with individualized and self-regulated forms of learning, others integrate digital devices such as tablets only as a supplement within existing, more teacher-centered instructional arrangements (cf. school profiles on the website of the initiative).

The implementation of new instructional formats goes beyond methodological innovation, as it transforms the very enactment of classroom practices. From a praxeological perspective, teaching is understood as a constellation of social practices that unfold in a multilayered manner. These practices are embedded in the

concrete situational conditions of the classroom, oriented toward specific goals and purposes of local classroom activities, structured by immanent normative orientations, and shaped by learning materials and task formats, which themselves carry a form of normativity embedded in these didactic objects (Breidenstein et al., 2025). Against this background, reforms can be understood as shifts in these practices that simultaneously generate new demands on students: in self-regulated and individualized learning contexts, they are increasingly expected to organize and structure their learning processes independently, for example in planning, completing, and documenting tasks (Yang et al., 2023). At the same time, they increasingly take on supportive and, in part, supervisory roles within cooperative arrangements (Idel and Rabenstein, 2018).

While processes of school innovation and development are often examined from an organizational or instructional development perspective, there are still comparatively few empirical reconstructions of how students themselves interpret these changes with regard to evolving social practices of instruction. Moreover, little is known so far about the role digital devices play in students’ conceptions of learning and instruction and how they appear in relation to different instructional orders. This article addresses this research gap by examining, on a case-specific basis, how students perceive and interpret instructional contexts that are considered in this contribution from the perspective of school transformation. Particular attention is paid to how the students under investigation perceive different instructional practices and interaction orders, structure them meaningfully in their representations of classroom instruction, and thereby render visible specific interpretations of teaching and learning processes.

The following analysis is based on a comparative reconstruction of two exemplary student drawings (Schelle, 2021). The data material was collected at two schools in a small town located in close spatial proximity to one another. Both schools use iPads in classroom instruction. While one school follows a more conventional orientation, the other participates in the “School of the Future” initiative and has experimented with, and partially implemented, elements of individualized and self-regulated learning. At the time of data collection, the student in question regularly participates in a digitally supported, adaptive, and self-regulated learning arrangement, which is implemented alongside regular classroom instruction within the framework of a pull-out model. In addition, further elements of individualized instructional practices are being explored in her school context on a project basis.

Methodologically, the article follows a qualitative-reconstructive approach that explicitly targets the latent level of meaning. In the data collection, students were asked to depict themselves while learning in class. The drawing task serves as a prompt to position themselves in relation to the school environment. Following the thesis of Scheid and Žižek (2017), children can articulate developmentally conditioned crises in the drawing process, even if these cannot yet be expressed verbally. The reconstruction thus opens up new perspectives on instructional experiences. It makes visible tensions and ambivalences within selected learning settings as well as students’ implicit interpretations and provides insights into the complexity of pedagogical situations. The reconstructed

¹Examples include the state program “Schule der Zukunft – Bildung für nachhaltige Entwicklung” (School of the Future – Education for Sustainable Development) in North Rhine-Westphalia (<https://www.bne.nrw/nrw/gemeinsam/angebote/details/landesprogramm-schule-der-zukunft/>), networks such as “Zukunftsschulen – Lernen in einer Kultur der Digitalität” (Future Schools – Learning in a Culture of Digitality) in Baden-Württemberg (<https://zsl-bw.de/Lde/startseite/uebergreifendes/zukunftsschulen-lernen-in-kultur-digitalitaet/>), and in Bavaria the program “Digitale Schule der Zukunft” (Digital School of the Future) (<https://www.km.bayern.de/digitale-schule-der-zukunft/>).

subjective interpretations are not intended to be generalized in a statistical sense. However, as the analysis aims at identifying underlying structural patterns of social practices, the findings offer insights that extend beyond the individual case and may be relevant for similar constellations.

2 A spatial-theoretical approach to student drawings of instruction

In the drawings, the social reality of instruction is not simply depicted by the students. Rather, they are the result of individual processes of perception and selection, in which students view instructional practice from their subjective perspective. Within the possibilities of artistic representation, the drawings document a reflective engagement with perceived instruction and are therefore initially to be understood as snapshots. At the same time, they condense various impressions and experiences of school practice, whereby what is depicted acquires a certain degree of stability.

The structural-theoretical considerations of Objective Hermeneutics provide the methodological framework for approaching the self-world relations emerging in the drawings. The reconstruction traces both the selective decisions manifested in the representations and the meaning structures objectified within them as specific expressions of self- and world-relations in each individual case. To further specify analytically this interplay of subjective perceptions, social orders, and objectified meaning structures, Lefebvre's (2006) theory of space is drawn upon in the following. This approach makes it possible to theoretically frame the relationship between the individual experience of instruction and the structural conditions in which this experience is embedded. For Lefebvre (2006, p. 331), space is understood as the result of social practice and is constituted through three interrelated dimensions: (1) spatial practices, (2) representations of space (conceived space), and (3) representational spaces.

- (I) Spatial practices encompass the use of space in terms of everyday actions and perceptions through which space is produced in the first place (Lefebvre, 2006, pp. 334 f.). From a praxeological perspective, space thus appears not as a given structure but as the result of social practices: subjects do not simply exist in space; rather, they actively constitute it through routinized actions, movements, and modes of use. By following specific social practices, they simultaneously produce space. In instructional contexts, this becomes evident, for example, in how students take their seats, orient themselves toward the teacher, or rearrange themselves within the classroom for group work.
- (II) Representations of space refer to conceived space, that is, the level at which space is mentally designed, organized, and structured (Lefebvre, 2006, pp. 335 ff.). This includes, for example, planning-related, institutional, and societal conceptions of order that determine how spaces are organized and how they are intended to be used (Nolda, 2006).

- (III) Representational spaces refer to lived and subjectively appropriated space (Lefebvre, 2006, pp. 336 ff.). This level encompasses the symbolic meanings, ideas, and experiences that subjects associate with a space. Here, space does not appear as a mere physical or functional order, but as a meaningfully experienced reality shaped by perception, imagination, and experience.

Drawings can be understood as subjective representations of space in which students construct their own conceptions of the active school order. At the same time, institutional conceptions of space and structural arrangements of instruction enter into these constructions as a kind of blueprint to which the subjective representations are oriented—thus functioning as a form of institutional representation within the subjective representation. Into this interpretive construct, the social practices lived within the space and their interpretations are in turn woven. In the drawings, all three levels thus condense into a construct that must be analytically differentiated in the reconstruction.

3 Objective-hermeneutic reconstruction of student drawings

The drawings are reconstructed using objective hermeneutics. In German-speaking contexts, this qualitative-reconstructive method is highly established and addresses structural contexts of meaning through a sequential interpretation of the material. Analytically, a distinction is made between a manifest level of meaning, which is directly accessible, and a latent level of meaning, which can only be reconstructed through a methodically controlled analysis. The intention behind the drawing or the feelings expressed in the self-portrayal can be considered within the framework of the method as a possible layer of meaning; however, they only gain significance against the background of the latent structure of meaning and therefore do not stand at the center of the research interest (Wernet, 2014). Originally developed for the analysis of texts, objective hermeneutics can be applied to various forms of protocols that document a spatially and temporally situated form of expression (Münste et al., 2022). This also includes images and drawings, for which the interpretative procedure has been correspondingly adapted (cf. Scheid, 2023; Scheid and Ritter, 2015).

The analysis is guided by the methodological core principles of sequentiality, literalness, context-freedom, extensivity, and parsimony (Mbaye and Schelle, 2025). The principle of sequentiality requires the reconstruction of the case in small, interrelated pictorial units. A sequence constitutes a visual unit of meaning, for example a specific object or a symbolic element. In the course of the analysis, the sequences can be expanded and may also include connections between different pictorial elements. The sequences are to be considered in relation to the other units of meaning in the image (Scheid and Ritter, 2015, p. 202), that is, the contexts of meaning are interpretatively explicated step by step between the individual sequences (Scheid, 2023, p. 287). It is precisely this extensive, systematic relating of sequences for the reconstruction of a coherent structure that describes the principle of extensivity (Scheid, 2023).

The principle of literalness requires a precise orientation toward the concrete expression in its given form, in the context

of image analysis in the sense of *depicted in this way and not otherwise*. Even the smallest details, as well as formal and compositional features, are taken into account in their specific manifestation. Following the principle of context-freedom, the context of the protocol's emergence is methodically set aside during the interpretation process in order to avoid premature attributions. Only after a context-independent reconstruction can contextual information be incorporated in a reflective manner.

The interpretation process proceeds through so-called readings. As a thought experiment, it is considered what meaning can be attributed to a pictorial unit and what sense is associated with it (Wernet, 2014). The formation of readings is to be understood as a kind of tool for uncovering layers of meaning in the course of sequential reconstruction. In the course of the analysis, the readings are systematically reviewed. In accordance with the principle of parsimony, only those readings that are consistent with the given form of expression are to be retained in the reconstruction.

The image-based interpretation follows a reconstructive three-step procedure. First, a detailed description of the respective sequence is provided in order to clarify the specific form of the pictorial element and to avoid premature attributions of meaning. In a second step, individual pictorial elements are interpreted, taking into account possible readings. In a third step, the reconstructed elements of meaning are systematically related to one another in order to determine their structural relations. The aim of this reconstructive procedure is the formulation of a case structure hypothesis that defines the specific structural constitution of the case under investigation in terms of its latent logic of meaning (Wernet, 2014).

The presentation of the image reconstruction is limited to central analytical steps due to space constraints; a detailed description of the pictorial elements is not included in the following analysis. For reasons of clarity, the sequential procedure of the reconstruction is also not fully traced; designations of figures and objects are used throughout rather than being introduced only after their formal reconstruction. In line with the principle of context-freedom, the fact that a student portrayed herself in the classroom was initially not taken into account. This aspect was only incorporated into the interpretation after the reconstruction of the school context. In addition, aspects such as pen and color choice, drawing style, drawing competence, line work, as well as clothing and personal characteristics of the figures were considered in the reconstruction. While these aspects are generally relevant for image interpretation, they showed no direct connection to the research interest in the present material and are therefore not elaborated further in the analysis.

Data collection took place during the 2024/25 school year. Both schools are located in close spatial proximity to one another, being only about 500 meters apart. At the same time, they are the only secondary schools in the small town. The conventional school context was situated at a Gymnasium, whereas the reform-oriented school context was examined at an integrated comprehensive school.² At the time of data collection,

no systematic documentation of the school's reform-oriented or digitally supported instructional practices was available. However, the class was deliberately selected in consultation with the school administration to ensure that the students had already gained experience with project-based elements of self-regulated, individualized, and digitally supported learning. These included forms of independent learning organization, adaptive digital learning opportunities, and learning arrangements that temporarily differed from regular classroom instruction. For the present analysis, however, the primary interest lies in how selective moments of instructional transformation become reflected in the students' orientations and representations.

Entire school classes participated in the data collection (conventional school context: grade 11, 17 drawings; reform-oriented school context: grade 7, 16 drawings). Participation was voluntary. With the exception of a small number of students, the classes participated almost completely in the study. In the reform-oriented school context, however, not all completed drawings could be included in the analysis because the required parental consent forms were not always returned. In most cases, the students were given approximately 35 min to complete the task. In some instances, the drawings were continued over a longer period of time during subsequent free periods or breaks.

To select the cases, the drawings collected at both schools were first examined within the framework of a first-impression analysis following Müller-Doohm (1997). This procedure enables an initial systematization of the data corpus and serves to identify individual cases for more in-depth analyses. The drawings were analyzed and categorized with regard to their central message, the persons and objects depicted, distinctive stylistic elements, and their respective modes of staging. In this article, school transformation is used as an analytical perspective to reconstruct how students perceive, interpret, and structure parallel or shifting instructional orders in their representations. The two cases were selected because their visual and symbolic composition renders contrasting forms of school-related learning and participation orders visible in a particularly condensed manner.

4 Reconstruction of student drawings

4.1 Student drawing 1 – conventional instructional context

4.1.1 Presentation of the drawing 1

The drawing (Figure 1) was produced by a female student in the eleventh grade of a Gymnasium. The interpretation began with the figure in the left half of the image (Figure 2, S1 = Sequence 1) and subsequently focused on the table and the pictorial elements depicted on it. It then turned to the tables as space-structuring elements, the teacher, and the interaction of the group on the right-hand side. In the further course of the analysis, the interpretation shifted to the upper half of the image, first examining the speech bubble and then the flowers depicted in the left half of the image.

²After primary school, students in Rhineland-Palatinate are assigned to different types of lower secondary schools based on their academic performance, typically at the age of 10–12. Academic-track programs are established both in traditional Gymnasium schools and within integrated comprehensive schools.



FIGURE 1
Student drawing collected in a conventional instructional context.

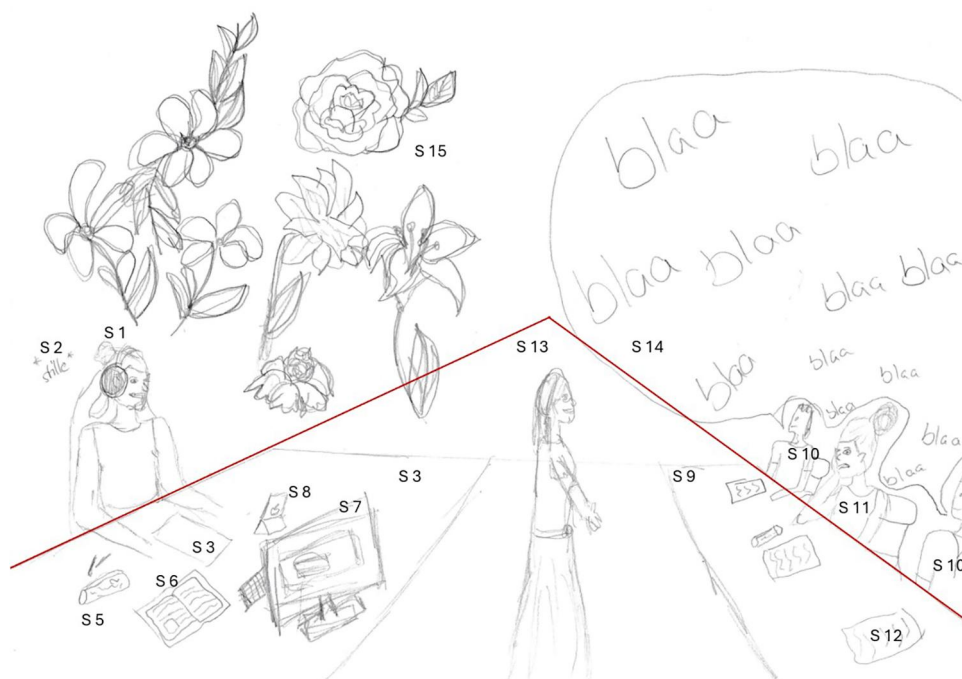


FIGURE 2
Sequencing of student drawing 1.

4.1.2 Self-portrayal and depicted action

The student portraying herself can be seen in the left half of the image. The slightly open mouth may indicate a possible act of speaking; at the same time, the figure sits upright and

appears to be embedded in an ongoing action. Particularly striking is the headset: the strongly emphasized ear area, rendered with dark and forceful lines, brings the sound insulation to the fore as a central feature. In close proximity to the figure's head, the inscription "Stille" [silence] is also placed,

explicitly marking the acoustic isolation. This indirectly points to an elevated noise level in the room from which the figure deliberately distances herself. At the same time, the accentuated depiction of the ear area suggests that the figure is only partially accessible to the communicative dynamics in the room. The headset thus functions as a double boundary marker: it protects against external acoustic influences and simultaneously positions the figure partly outside the immediate communicative contexts within the room. In this reading, the headset acts as a structuring element that regulates perception, social accessibility, and possible communicative acts within the space.

The suggested headrest of the chair resembles that of an office or desk chair and signals increased seating comfort for longer activities. Such furniture is usually assigned to a single person and points to a personalized workspace. The space thus appears as an individually appropriated place—such as an office or a bedroom—and establishes connections both to the world of work and to forms of private learning. In this reading as a workspace, the headset points to parallel work on similar content, in which communication does not take place in the immediate physical space but is mediated through media. Transferred to the context of instruction, learning thus appears as an activity that is not necessarily tied to face-to-face interaction but can also take place independently of the local space and be organized individually.

On the table, a pencil case with pens, an open book or notebook, and a blank sheet of paper are arranged in front of the figure. In combination, these pictorial elements point to a learning or school context. They are complemented by two technical devices: a smartphone set up with its screen facing the figure, and a stationary PC with a keyboard. Such an arrangement of devices would be rather atypical in a regular classroom situation, where tablets are primarily used and smartphones are expected to remain switched off in students' bags. In this configuration, the digital equipment is more reminiscent of a private bedroom. A possible interpretation is therefore that the drawing refers back to experiences of pandemic-related distance learning, which serve as a biographical frame of reference. What may thus become visible is a conception of digitally supported instruction that simultaneously points to a possible transformation: a future learning setting that draws on past learning experiences.

With regard to their functions, the two digital devices open up the possibility of engaging with different content in parallel. While the smartphone tends to suggest reception, the PC implies additional processes such as writing, formatting, or sending. In combination with the analog working materials, learning and working thus appear to be organized in hybrid arrangements. The depicted modes of use are thereby made more flexible on the one hand, and more complex through their interweaving on the other.

4.1.3 Spatial structure and differentiated spaces of action in the representation

Despite echoes of a bedroom, the figure remains spatially embedded within the overall composition. In addition to the need to acoustically isolate herself, the continuous horizontal connection of the tables makes clear that this form of individualized learning is located not outside, but within the

school order. Overall, the depiction of the tables shapes the spatial structure of the drawing. Both tables are oriented toward a common vanishing point and together form a triangular structure, indicating the use of principles of perspective representation—possibly derived from art lessons. The tables lack legs; they only become recognizable as such through the interplay of the lines. As a result, it is less their material form than their structuring function for the spatial arrangement that comes to the fore.

As a reading, the interpretation of the spatial structure as a playing field with three zones was developed, thereby highlighting the normative dimension of the arrangement. Each “playing field” [playing field] is associated with specific rules and possibilities for action.

At the center of the triangle is a teacher oriented toward the group of figures on the right. Her head marks the apex of the imagined triangle and makes her appear as an instance guiding the activity. Her attention is directed exclusively toward the right half of the image; the left side remains unattended. While the middle and right playing fields interact with one another, the student on the left appears separated—the teacher has turned her back to her. Accordingly, the student producing the drawing distinguishes between two different spaces of action: a right half of the image that unfolds a teacher-centered interaction order, and a left area that appears as a technologically mediated terrain of action. Within this space, individual control and insulation are structurally enabled, without the figure fully leaving the overarching school order.

The figures in the right-hand area of the image are arranged sitting closely next to one another. The central figure shows clear similarities in clothing and hairstyle to the self-portrayal in the left-hand area of the image, so that it can also be read as a representation of the drawing student. This creates the impression that the student juxtaposes herself in different contexts of action, thereby producing a contrastive arrangement of the depicted situations. While she portrays herself on the left as engaged in a learning activity, the head of the figure on the right, supported by the hand, can be interpreted as an expression of fatigue or distance. This contrast continues in the depiction of the chairs, which in the right-hand area resemble typical school seating. This opens up a reading of a contrast between a private, personalized, and long-term workspace on the left and a public, functionally oriented, and uniform setting with a rather short duration of stay on the right.

Above the group of figures on the right, a comparatively large speech bubble is depicted, fed by the outer figures. What is striking here is less what is shown than what is absent: a dialogical structure in the sense of individual, successive speech bubbles is missing. Instead, the shared bubble is filled with the repeatedly written expression “Blaa” [blah blah]. In German usage, this expression refers to empty communication; it stands for simultaneous speaking without any recognizable exchange—for speech without substantive content. The communication of the classmates thus appears as a homogeneous background noise. The student portraying herself on the right remains the only one not connected to the speech bubble and thereby excludes herself from the depicted communication.

The gaze of the outer figures is directed toward the teacher in the center, yet their hands remain hidden beneath the table. The apparent attentiveness of the figures is thus contrasted by a

partial concealment. On the latent level, a striking difference emerges between visibility and withdrawal, which can be read as a visual indication of distance or latent refusal. In contrast, the openly rejecting stance of the self-portraying student appears less risky: she withdraws from the interaction visibly, without concealing her position.

For the right playing field, implicit rules of action can thus be reconstructed that suggest two options: a formally visible participation while simultaneously withholding one's own stance, or an open refusal to participate. In the middle playing field, the teacher's attentiveness is depicted through outstretched arms. Both options for action in the right-hand area remain possible within the framework established by this gesture and appear to have no discernible consequences. For the instructional act itself, it thus seems irrelevant whether actual participation or interest is present.

In the upper left area of the image, various types of flowers are depicted—of comparable size and visual prominence—floating above the student positioned there. They appear as a visual counterbalance to the noise-dominated right half of the image. The emphasized linework also establishes a connection to the accentuated ear and the inscription silence. Calmness and naturalness are thus constructed as a unity. In this area, learning appears less shaped by communication and instead as a more focused and substantively grounded process.



FIGURE 3

Student drawing from an instructional context in the process of reform.

4.2 Student drawing 2 – instructional context in transformation

4.2.1 Presentation of the drawing 2

The second case (Figure 3) was produced by a female student in the seventh grade of a comprehensive school. The interpretation began with the student's self-representation and then focused on the thought bubble as well as the graphic positioned above it (Figure 4). It then turned to the table and the objects arranged on it—first those to the right of the figure, followed by those positioned to her left.

4.2.2 Self-portrayal and depicted action

The drawing appears unpracticed, yet clearly executed with care. Despite imprecise proportions, there is a visible attempt to depict an individual face. Colors are used deliberately: the hair is lightly colored brown, and the chin-length hairstyle is clearly recognizable. Also striking is the green-and-black striped sweater, which is distinctly emphasized. The student producing the drawing thus places the focus of the representation on herself rather than on relational dynamics with classmates or teachers. She presents herself, makes herself recognizable, and aims to make her learning as transparent as possible. The hands are visible and hold a notebook or book. Indicated lines symbolically refer to written content and thereby mark involvement: the figure appears active and already engaged in a task.

A thought bubble extends from the figure's head, in which the sentence "Melden wenn ich die antwort weiß" [raise my hand when I know the answer] is written. The term "Melden" [raise one's hand] refers to a practice of classroom action that is tied to the institutional order of the school. Raising one's hand signals a

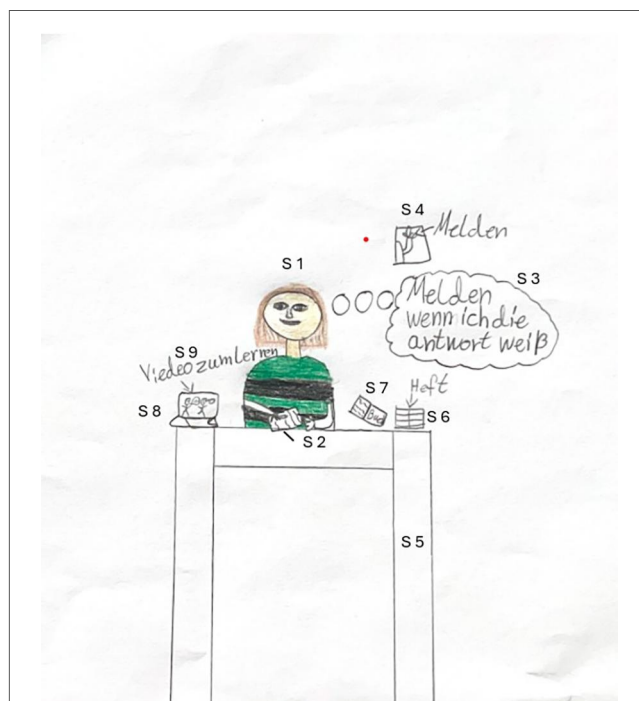


FIGURE 4

Sequencing of student drawing 2.

willingness to participate in rule-governed communication through a verbal contribution. The term "antwort" [answer] further points to a reactive structure of classroom interaction. Speaking thus appears not as an initiating contribution, but as a response to a task posed by another party—implicitly by the teacher. Accordingly, the

student does not position herself as a co-constructor of a shared thinking process, but as a respondent within a pre-structured question–answer order. The phrase “wenn ich die antwort weiß” [when I know the answer] further suggests that the student interprets the behavioral rules of the depicted classroom in such a way that speaking is only permitted when one is certain of the answer. Speaking thus does not appear as a process of joint reflection or as part of an exploratory or questioning process, but as a sequence of teacher questions and correct student answers. The inscription, depicted as disproportionately large in relation to the figure, indicates that the student attributes particular significance to this rule for her own school-related actions. In connection with the emphasized visibility of her own person, this creates the impression that having understood and behaving in accordance with the rules function as central points of orientation within the depicted learning process.

It is striking that the figure in the depicted scene does not raise her hand; the hand remains down. This can be read as indicating that, in the concrete situation, secure knowledge may not be available and that, accordingly, no verbal contribution is made in line with the formulated rule. At the same time, orthographic irregularities appear in the written formulation; the statement contains a comma error as well as an inconsistency in capitalization. At this point, the interpretation considers whether content-related or linguistic uncertainties might exist that could hinder participation in accordance with the stated rule. However, alternative readings are plausible given the situated production of the drawing. The orthographic inaccuracy may equally reflect a stronger focus on the visual and semantic representation.

Above the thought bubble, a small box is inserted showing a schematically depicted raised hand. Next to it is the inscription “Melden” [raise one’s hand], accompanied by an arrow pointing to the raised finger. The representation explains the practice of raising one’s hand in a simplified form, as if it required separate visualization. This may indicate that the depicted process is not taken for granted but appears to require explanation—perhaps for a viewer who is not familiar with school-based rule knowledge. In the German school context, however, “sich melden” [to raise one’s hand] is generally considered basic, routinized knowledge. The fact that this practice is nevertheless explained here may suggest that this taken-for-grantedness is called into question in the depicted instructional context. The visualization may mark a situation in which established rules of classroom action are being newly reflected upon or appear uncertain in their validity. From this perspective, the representation can also be read as an indication of transforming symbolic orders in more individualized learning contexts. At the same time, the explicit marking can be interpreted as a form of self-assurance. The student once again makes visible that she possesses rule knowledge and is familiar with the correct form of participation. On the latent level, this reveals a strongly norm-oriented orientation toward action, aimed at adapting to school-based orders.

4.2.3 Interpretations of objects

The table is prominently emphasized. Its disproportionately large, thickly depicted legs and the massive tabletop—apparently drawn with a ruler—highlight its structural character. On the latent level, this can be read as an indication of an ordering,

normatively charged framing of instruction. The table assigns the figure a fixed place in space and binds her to it; it thus functions as a space-structuring element that limits movement and possibilities for action. Accordingly, the instructional situation appears strongly framed by normative structures. The figure’s legs and feet are not depicted; everything below the edge of the table is omitted. This may indicate that this area is considered irrelevant for the learning situation. At the same time, the table can be interpreted as a protective or delimiting element behind which the figure can partially conceal herself. The proportions between the table and the figure support this interpretation.

Various objects are placed on the table. To the right of the figure, a small book and stacked notebooks are indicated schematically. In the depiction, they are reduced to rectangular basic forms, yet become identifiable through labels. The student thus explicitly refers to learning materials as part of her activity. The objects are laid out and appear ready for immediate use; the open book signals availability and readiness. Overall, an impression of preparation and order emerges. What becomes visible is an anticipated expectation of the school environment: school-related norms—such as readiness, completeness of materials, and capacity to work—are internalized and visually reproduced.

On the left edge of the table, a digital device is positioned; its holder makes it identifiable as a tablet. Above it, the inscription “Viedeo zum Lernen” [video for learning] appears, which again shows an orthographic uncertainty (the word “Viedeo” is written as “Video” in German). Here, too, the explanatory marking is striking: objects and practices are not only depicted but additionally labeled. Overall, the drawing appears to strive for clarity and to secure its own representation. The tablet is positioned in such a way that the screen is visible to the viewer. Visibility is thus also established with regard to the content of the screen. A specific purpose is explicitly attributed to the video—it is “zum Lernen” [for learning]. The learning object is therefore presented in a mode of explanation, rather than being developed through a shared conversation.

On the screen, two simple stick figures with speech bubbles are depicted, indicating a communicative event in the digital space. Sociality is thus not located in the classroom but shifted to a digital level. The interaction appears to be mediated through media and, for the student, one-sided. The figure is positioned relatively centrally in the image; a relation to other actors such as the teacher or classmates is not explicitly established. Sociality in the physical space thus hardly comes into view and remains limited to media-mediated interaction.

What is also striking is the spatial arrangement of the materials: the digital device is positioned on the left, while the analog learning materials are on the right. Through the placement of the thought bubble and the visualized raised hand on the side of the analog objects, an implicit association is established: the school practice of “Melden” [raising one’s hand] appears to be tied to an analog-structured instructional order. For the digital setting, this rule does not seem to apply in the same way. The different orders are thus suggested, yet remain latent and not clearly distinguished from one another.

5 Comparative analysis of the cases

The two drawings can be read as different forms of the appropriation of instructional space in the sense of Lefebvre

(2006). In both representations, subjective perceptions of spatial practices condense in the context of each school's instructional concept. Particularly prominent is the third dimension of space—the lived space—which in both drawings points to a certain parallelism between an established and a (potentially) transforming instructional order. The subjective interpretations, as a blueprint of the transforming structural arrangements, provide insights into the tensions that emerge at the level of spatial practices through this transformation.

In the conventional instructional context, the classroom space appears from the student's perspective as a juxtaposition of two orders. In her drawing, she contrasts an existing state—communicatively dominant yet lacking in content—with an anticipated alternative. The left half of the image, as a hoped-for future form of instruction, points to a technologically mediated form of decoupling and distancing in which media-based self-regulation is made possible. Digital devices, or digitally supported instruction, are thus interpreted as a means of organizing this distance within the institutional framework.

The depicted representation of space reflects less the lived reality of school practice. Rather, the conception of self-regulated instruction appears to draw on experiences of pandemic-related distance learning as well as on perceived reform movements. An imagined, hybrid instructional space is constructed, in which digital and analog forms of learning are combined. The space appears private and oriented toward longer-term use, offering more room as well as flexible forms of learning. The connection to instruction remains, but is organized less interactionally and more as a form of coexistence. In the representation, specific wishes and needs of the student become visible: the need for quiet, for space to work that makes it possible to spread out materials, as well as for self-regulation and structuring within one's own learning process. Learning is thus intended to become more strongly oriented toward students' individual ways of working.

In the partially reformed instructional context of the second drawing, a marked uncertainty in the interpretation of normative expectations becomes evident on the latent level. In the reconstruction, a possible cause was identified as the coexistence of two different instructional orders at the structural level, with the student apparently unable to clearly determine which expectations continue to apply and which new demands the transformed instructional context places on her. With regard to the dimension of spatial practices, the practice of “Melden” [raising one's hand] refers to a familiar, analog-structured interaction order in which participation is organized through rule-governed verbal contributions (for the German school context, see also Böheim et al., 2024; Budde, 2011). By contrast, learning in the digital setting appears as a receptive appropriation of explanations without the possibility of immediate participation. The striking emphasis on the practice of raising one's hand can, against this background, be read as a form of reassurance; the student seems to seek confirmation of the continued validity of this familiar school rule. Accordingly, the drawing can be understood as an expression of a search for orientation with regard to the prevailing social practices in a transforming instructional context.

It can be assumed that the observed uncertainties are also due to the fact that no consistently coherent pedagogical concept has been implemented at the school. Rather, participation in

reformed learning arrangements occurs only selectively, both in temporally limited sequences and within individual projects. As a result, the student is required to navigate between divergent interactional and practice-based orders in everyday school life. In her perception and representation, however, these do not appear as sequentially organized but rather as simultaneously coexisting orders.

6 Discussion and contextualization of the findings

In the search for orientation in the second case example, the relativity of school-based orders in processes of transformation becomes evident. Within the transformation process, students actively contribute through their actions to confirming new normative orders of a school and making them effective for themselves. In this context, Idel and Huf (2023) discuss the role of students as “co-playing accomplices”, as they must perform complex acts of adaptation and orientation that are necessary for the success of reform initiatives—such as individualized instruction. However, case 2 makes clear that this process of adaptation is by no means smooth. Rather, the transformation of existing orders is initially accompanied by a destabilization that must be taken into account and supported accordingly. The reconstructed student drawings thus make visible how such changes manifest at the level of concrete instructional practices and interaction orders from the learners' perspective.

While studies on German instructional contexts show that the introduction of digital devices alone does not necessarily entail a fundamental transformation of interaction orders in the classroom (Wolf and Thiersch, 2023), drawing 2 illustrates particularly clearly from the student's perspective how interaction orders may shift when instruction is increasingly organized around self-regulated learning and digitally supported practices. In particular, the case reveals that students perceive different interaction practices, while at the same time it is not always situationally clear which forms of interaction and which expectations are considered valid within the instructional context.

The aspect of the spatial proximity of the two schools was deliberately considered in the case selection, as it can be assumed that students exchange information about developments at their respective schools. In the reconstruction of the drawing from the conventional instructional context, it becomes clear that the parallel existence of different instructional models is perceived and stimulates students' own conceptions of instruction. The imagined hybrid learning space can therefore also be understood as a response to perceived differences between school learning environments. The reformed instructional context thus functions as a frame of reference against which the student contrasts her current instruction with an assumed future instructional context. The reform discourse circulating within the local school environment is thereby taken up, further developed, and linked with the student's own needs.

With regard to the scope of the study, it should be noted that the findings of the case analyses are grounded in the structures of specific case contexts and are therefore only transferable to other school contexts to a limited extent. Accordingly, the aim of this article is not to generalize specific student orientations, but

rather to reconstruct possible tensions that may emerge in the context of school transformation processes. Overall, both analyses show that students perceive processes of school transformation with sensitivity, even when these are only partially implemented. Changes are actively interpreted within the cases and translated into students' own conceptions of learning, which are closely linked to personal needs and experiences. At the same time, possibilities for participation and action within an instructional context are reflected upon in a differentiated manner.

Following Idel and Huf's (2023, p. 83) argument that students co-constitute and reproduce school orders through their everyday practices, the potential of the present analysis lies in providing insights into the interpretative processes through which this participation takes shape in the context of school transformation. Participation is thus not understood as direct active involvement in school development processes (for a critical discussion, see Gallacher and Gallagher, 2008), but is instead approached through the reconstruction of latent meaning structures and relational configurations within classroom interaction. In particular, tensions, ambivalences, and antinomic structural moments of school orders (Helsper, 1996) become visible, as these are negotiated and interpreted in the students' representations. The analysis thereby offers insight into how students orient themselves within shifting instructional orders and which implicit demands and uncertainties may become relevant in this process.

Data availability statement

The datasets presented in this article are not readily available because the dataset consists of anonymized student drawings. The study was registered with and approved by the Supervisory and Service Directorate of Rhineland-Palatinate and conducted in accordance with relevant institutional and legal requirements. Participants were informed about the study, and written informed consent was obtained from all participants; for students under the age of 14, consent was provided by their legal guardians. The drawings do not contain any personally identifiable information. Publication is permitted for scientific purposes only, provided that participant anonymity is ensured. Requests to access the datasets should be directed to nell-mueller@uni-mainz.de.

Ethics statement

Ethical approval was not required for this study because the data consisted of anonymized student drawings and did not

contain any personally identifiable information. The study was approved by the Supervisory and Service Directorate of Rhineland-Palatinate. Written informed consent was obtained from all participants. For participants under the age of 14, written informed consent was obtained from their legal guardians.

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SN-M: Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing.

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