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Chapter 10
Creating a New Object in Classroom: A Pedagogical Design for Innovation and Observation[1]

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In order to learn: It is better for students to imitate and reproduce models? Or to be creative and face the difficulties of producing their own new objects?

The widespread dissemination of a certain interpretation of the work of Vygotsky, Bruner, and the researchers who have drawn inspiration from these authors, has turned into a commonplace vision, a social representation of teacher-student interaction that is neither faithful to its inspiration nor to reality[2]. We will begin by sketching this commonplace vision in order to take a critical stance towards it, and draw new horizons for the study of teaching and learning processes, and for the development of professional skills. We will then present our efforts to offer teacher-trainers (and even teachers themselves) a methodology that allows them to do two things at a time: (1) to position themselves as the

1 This research was carried out within the Knowledge Practices Laboratory (KP-Lab) project of the 6th European Framework Program. We are grateful for this support.

2 We want to clearly warn the reader that we are talking here about the social representation (a caricature of Vygotsky and successors) that we encounter much too often and not about the theoretical model itself, which is infinitely richer and more fertile.

main actors on a stage where they are creative in designing opportunities for their students to engage in creative activities, and (2) to conduct critical observations of what is happening then in order to adjust their actions progressively and, reflecting on them, to broaden their understanding of the processes at play.

In this methodology, teacher-trainers, teachers, students, and researchers accompany each other in their self-critical and reflexive attempts to carry out their activities. The successful creation of an *object* is at the center of these activities. In the example studied, this *object* is different for each category of actors even if they are involved in joint actions. For the students, it is a matter of composing a small piece of music to be performed in front of the classroom. For the teacher, it is a matter of making these creations possible for the students and improving their quality by offering them adequate contextualized knowledge just-on-time. For teacher-trainers, it is a matter of being able to adjust the information and support to be given to trainees on the basis of the precise observations of their needs, difficulties, and strategies, but also of their own students' behaviors. For researchers, it is an opportunity to provide conceptual resources and methodological support to enrich these observations, and to have as the object of study not 'third-person' subjects ('they do', 'they say', 'they think', etc.) but partners who express themselves in 'first person' ('I wish', 'I predict', 'I react', 'I hypothesize', etc.). All partners are able to observe, *in situ* and over time, complex socio-cognitive dynamics and their outcomes.

The center of attention is then the 'pedagogical triangle' (Chapman, 1991; Engeström, 1987; Houssaye, 2000; Schubauer-Leoni, Perret-Clermont & Grossen, 1992; Zittoun, Gillepsie, Cornish & Psaltis, 2007) as it develops in time with its ups and downs, its moments of common understandings but also misunderstandings.

Overcoming a pseudo-Vygotskian reductive theory

In the social representation of the teaching and learning activity that circulates, learning is too often seen as an end in itself, detached from the overall context of activities that enable it, and without any connection to the *creation* of knowledge. Learning appears to serve the sole purpose of acquiring knowledge and skills defined in a more or less

abstract manner. Additionally, the relationship between the teacher or the student and the object of learning is scarcely considered, with the focus instead being fixed on knowledge, to the extent that sometimes the object and knowledge are conflated. Teaching is reduced to the sharing of knowledge possessed by the expert. It is assumed as self-evident that any 'normal' student will readily engage in the activity proposed by the teacher, respond to his or her desire for transmission, and commit not only to completing the assigned task but also to assimilating the knowledge that the execution of the task is supposed to generate. This representation envisions the expert as a sort of image of the state the student should reach, and it imagines the student identifying sufficiently with the teacher to want to appropriate the teacher's knowledge through joint activity. There is no discussion of any intrinsic interest in the object from either the teacher's or the student's perspective.

As far as the teacher is concerned, this pseudo-Vygotskian representation presumes that, as bearers of knowledge, they would almost naturally know how to adjust their discourse and actions to those of the student in order to support both their participation in the activity and their learning efforts. The teacher would enter (instinctively?) the novice's zone of proximal development, naturally reinforcing the learner's actions and discourse to ensure success, which in turn would give meaning to the activity. In doing so, the expert would also provide semiotic resources to the novice who, gradually, would become capable of accomplishing independently what they could only participate in until now. The novice would start developing their own discourse and reflection – yet it is not clear how the teacher's discourse and knowledge could become the student's own reality when the latter is confined to the role of an imitator.

Rediscovering the pleasure of creating objects

In order to contribute to overcoming this very reductive social representation of the teaching/learning situation, we will present here an approach which seeks to restore, within a Vygotskian approach, a place for the object and for the student's interest in the object. This approach also aims to provide trainee teachers with a methodology enabling them to observe, for professional purposes, the complexity of

the teaching/learning situation. We will borrow from Claparède (1931) and Piaget (1947) the hypothesis that the child's own activity and, in particular, their interest, plays a fundamental role in learning. We are thus following a long tradition, taken up in particular by the philosopher Henri Bergson, the biologist Jean Piaget, and the pedagogues of the *École active*, in considering that creativity characterizes the living: a living thought is a creative thought that appropriates knowledge to respond to problems that it poses in his or her relationship to the world, including the world of objects and people (and not only the abstract world of ideas and knowledge). This appropriation necessarily involves a form of 'translation', extracting knowledge from its initial context (the context of its genesis) to 'translate' it, i.e. to move it into the context that presently intrigues the thinker. This displacement requires some adjustments. It is a process of reappropriation, of transforming a tool into an instrument (Rabardel, 1995), which is marked by the motives and interests of the person concerned and by the demands of the context *hic et nunc*. It necessarily requires creativity.

It is important to highlight the role of creativity in learning. As well-described by Piaget, creativity involves both accommodation and assimilation: (1) accommodating the object (whether material or conceptual) while experiencing the pleasure of doing, acting, mastering, and anticipating; and (2) transforming mental schemes and structures to adapt them to the actual reality of the objects (material or conceptual) in order to assimilate them, i.e. to understand them. These schemes and structures encompass perception and memory, as well as the capacity to represent them, or even to imagine that they could be different that what they are. The working of the mind, which is inherently creative and can offer playful pleasure but also the basic pleasure of feeling alive, of experiencing one's strengths and potentialities, of imagining oneself in an elsewhere, of projecting oneself in an imagined world, of discovering the object so to say 'face to face' because the object is always simultaneously an externalization of a part of oneself and an entity with an autonomy of its own: every human being, from a very early age on, can discover it, if he or she is given the opportunity to be active and to create objects. This pleasure can resonate with the pleasure of companions engaged in a joint actions, provided that adults and peers, thanks to an adequate framework, respect each one's space and the possibility of initiative.

An issue for schools

In the prevalent social representation of teaching and learning, once the expert has shared the knowledge, the expert has the power to validate this learning and acknowledge the student as a new expert on the learned topic, provided that the student demonstrates its mastery as expected by the expert. The knowledge initially possessed by the teacher is then rightly or wrongly considered to be internalized by the student. However, there is no explicit account of the creativity of the student (which could enrich that of the expert!) nor place for the co-construction of new objects (material or conceptual) that could emerge from the teacher-student interaction. Such a social representation of the teaching/learning process is quite conservative from a socio-cognitive standpoint: it tries to explain how experts' knowledge is transmitted (reproduced) but it does not shed light on how new knowledge emerges in a society. It does not invite exploration of how new solutions can arise from interactions not only among experts but also between experts and novices or among novices. Yet, the present challenges of our time increasingly demand that schools foster innovation. Schools are expected to support the development of the capacity in children to solve new problems, to jointly create solutions in complex situations, to manage distributed actions and knowledge within a team, to anticipate joint actions and adjust to them, to recall co-constructed solutions, to imagine finding solutions to unforeseen problems. It is crucial for schools to draw upon a psychology of learning that addresses these skills and inspires properly designed pedagogical activities that facilitate and nurture their development.

Others have revisited this pseudo-Vygotskian social representation (e.g., Fernandez, Wegerif, Mercer & Rojas-Drummond, 2001), notably by building upon Bruner's original work (Wood, Bruner & Ross, 1976; Bruner, 1983), but forgetting that it dealt with the relationship between mothers and their very young children or the relationship between (mostly female) educators and young children (for example: Wertsch, 1988; Rogoff, 1990). Generalizing beyond these age groups makes the researchers blind regarding other types of relationships. The properties of the specific relationship between a mother and a young child are not identical to those of other types of institutional relationships, for example, that between a teacher and a student (or rather between a teacher

and a large group of students in a classroom). Not all learning arises solely from this type of relationship (even though the power of these initial interactions is undeniably fascinating). Furthermore, the prevailing social representation tends to idealize this 'mothering' relationship and this creates other distortions.

This social representation overlooks the fact that Vygotsky (1925/1971, 1930/2004, 1931/1994) studied creativity in his work; and that Bruner and his successors (e.g., Barth, 2004) consider active learner discovery to be essential. Various lines of research (Bruner, 1996; Edwards & Mercer, 1987; Mehan, 1979) draw attention to the fundamental role of the teacher not only in the transmission of knowledge but also in the implementation of different formats of interaction in the classroom with communicative styles adapted to the different tasks and goals (César & Kumpulainen, 2009; Mercer, 1995; Mercer, Wegerif & Dawes, 1999; Schwarz, 2009). These goals should not be confused with (or reduced to) issues, important at a given point in development, of imitating or seducing a parental figure.

A teacher transmits knowledge but also a mode of interaction with the knowledge and a stance towards it

In the laboratory, the experimental studies of dyadic interactions between experts and novices (Tartas, Baucal & Perret-Clermont, 2010; Tartas & Perret-Clermont, 2008) have shown that what is learned is not only knowledge, but also a format of interaction, a mode of interaction: and that transferring these learnings into new relationships is not straightforward, especially if the novice believes that they involve language norms or rules of action that they must primarily conform to, even if that is not what the experimenter expects from the children.

Piaget had already drawn attention to the essential role of the learner, who can only answer a question (and therefore, learn) when they genuinely ask it themselves. A 'conflict' needs to arise from a contradiction between their expectations and what they perceive from reality: this gives rise to a 'cognitive conflict' that they must resolve to avoid staying in a state of imbalance (Inhelder, Sinclair & Bovet, 1974; Piaget, 1947). It was later demonstrated that this cognitive conflict is frequently,

in reality, a 'socio-cognitive' conflict, as it arises not solely from an internal reflection on reality but rather from a clash of perspectives between individuals (Perret-Clermont, 2022). Research on socio-cognitive conflict has highlighted that for learning to occur, it is not always imperative to have an expert involved. Novices engaging with each other can also, under certain fairly specific conditions, learn through the process of generating new knowledge (Ames & Murray, 1982; Doise & Mugny, 1981; Howe, 2010; Littleton & Howe, 2010; Littleton & Light 1999; Perret-Clermont, 1980; Schwarz, Perret-Clermont, Trognon & Marro Clément, 2008). These results can be read as shedding new light on the interpersonal relationships that enable learning: it is not necessarily asymmetrical and transmissive. These results show that novices interacting with each other are sometimes likely to produce new knowledge that none of them possessed before. They also draw attention to the conditions that allow not only the transmission of knowledge already mastered by one of the partners in the interaction but also the creation of new knowledge for each other. And this is important for those who want to understand the fruits of thinking and not limit themselves to the mere description of the reproduction of knowledge already held. Creating a new object (material or conceptual) requires doing something new with old. How is this done? How can a teacher support this process? This is not well known. Conversations have rules and the cognitive processes involved in these conversations are dialogical. It can be interesting to observe them closely and this is one of the goals of the methodology that will be presented below.

What is the object of the joint activity?

There is often ambiguity regarding the goal behind a precise educational activity: is the goal to execute the task to the best of one's ability, to find a solution, to create something, or to produce a highly anticipated outcome (often assessed in schools through grades)? Or is the priority to learn (i.e., to develop a conscious and sometimes abstract piece of knowledge), with the task merely serving as an occasion for learning and not an end in itself? Frequently, the school curriculum or even the teacher focuses on learning, while the student believes that successful completion of the task is the goal (especially if it is graded). However,

from a scientific perspective, we often know little about the relationship between successful completion of the task of the curriculum and learning: one does not necessarily lead to the other.

Studies grounded in activity theory (e.g., Burnard & Younker, 2008; Engeström, 1987; Engeström, Riettiner & Punamäki, 1999; Hakkarainen *et al.*, 2006; Ludvigsen, Lund, Rasmussen & Säljö, 2011; Muller Mirza, 2005; Muller Mirza & Perret-Clermont, 2008a) prompt us to reevaluate our understanding of teaching/learning by consistently questioning the purpose of the activity in which educators and students are involved. While the official objective typically revolves around knowledge transmission, it is essential to consider whether this objective is genuinely realized in practice. Observation (Perret, 1985; Perret & Perret-Clermont, 2004) shows that this is an ambition that often remains formulated in an approximate and abstract way, usually followed by a careful operationalization but without scientific verification that the desired objective is achieved. From the students' point of view, it is often mainly a question of completing the tasks prescribed by the teacher as quickly as possible, in accordance with a set of institutional requirements. And how does the teacher deal, consciously or unconsciously, with the dual challenge of completing the task successfully and learning? How does the institutional division of roles between the teacher and students unfold, along with the role of tools and objects, and the reciprocal adaptation to the (often implicit) goals of each participant?

In the wake of these questions, one might also ask under what conditions the professional knowledge of the teacher can be transmitted. For example, if a teacher manages to teach students satisfactorily, will the same teacher be able to pass on know-how to fellow teachers or young trainees? What problems will this transfer encounter? What could make it easier? Very often 'teaching methods' have been presented as if they had a life of their own. But in fact, they exist only through their contextualizations and are dependent on the interpretation of those who use them according to the institutional insertion of their activity, the evolution of the classroom, their goals, and the many other, often-implicit, realities that underlie the situation. As a result, each use of a 'pedagogical method' is each time a 'new edition', different, and sometimes not very comparable, to the previous ones (Bonvin, 2008; Cardinet & Weiss, 1976; Muller Mirza & Perret-Clermont, 2008b; Sandoval, 2002). The use of a method necessarily confronts the teacher with a kind of paradox: it provides a framework and resources to guide action, but at

the same time, the teacher must remain creative to adapt the instrument to the conditions on the ground. What are the conditions for the teacher's independence and agentivity in the face of what a method seems to prescribe? How can a trainer inform, 'train', and support innovation at the same time? The teacher in training, much like the student, requires a framework that is both secure and open, enabling the creation as well as the assimilation of knowledge held by others. This knowledge should not remain abstract but should seamlessly integrate *just in time* into their actions in the classroom.

If the role of the teacher is not only to transmit and if peers are likely to have a role in the cognitive progress of the learner, then how can the understanding of the different modalities of teacher action be advanced and how teachers can be trained to do so? We will be addressing these questions because of our scientific interest in capturing the aforementioned processes in real-time, and because, additionally, we are driven by our professional interests as higher education teachers. Besides, one of us (Marcelo Giglio), after being a musician, is now teacher trainer and responsible for developing research programs on learning and training processes. At all levels, the aim is to facilitate the expression of creativity in the learner (whether the learner is a student or an adult in professional development).

A methodology of observation

Observing these processes: Example of musical creation in a classroom situation

We will not attempt here to justify the choice of music as the object for this research, as it is born of our personal predilections and circumstances. However, it is important to note from the outset that music education is not a minor discipline. It holds significance in both school traditions (music has been taught as a subject since Antiquity in almost every country) and in terms of the complexity of the knowledge involved. Giglio has pointed out that even though contemporary school curricula emphasize the importance of fostering musical creativity, in practice, schools often prioritize listening to a repertoire, reading, singing, and even instrumental performance, while seeming to neglect (or feel challenged by) the activity of musical creation (Giglio, 2006; Giglio

& Oberholzer, 2006). However, observations of young people's musical activities outside of school reveal that not only are they capable of creating music, but they also thoroughly enjoy doing it. The significant role that music creation plays in their leisure time with peers is well known.

The aim of the present project is to examine how to make room for the activity of musical creation within classroom activities, based on an approach of observation *in situ*. We are, therefore, seeking to develop an observation methodology that will enable us to address the questions raised above: observing students creating (in this case musical objects); observing students acquiring and making use of knowledge held by the teacher; observing the relationship between the activity of creation and learning, with particular attention paid to awareness, the formulation of technical solutions, the appropriation of external inputs, observing teacher's actions and understandings, etc.

To achieve this goal, Giglio gradually developed pedagogical sequences (Giglio, 2010a, 2010b, 2013/2015; Giglio & Perret-Clermont, 2010) that placed collective musical composition at their core. These compositions were progressively enriched through input from the teacher based on the students' needs or desires, or openings suggested by the teacher. Giglio first refined these pedagogical sequences through various trials with his own students. He then handed them over to teacher trainees he was responsible for and observed their functioning. Finally, he shared them with other teachers from different countries, accompanied by an observation process. In parallel with the pedagogical activity, an observation process, partially inspired by that of other researchers (Schubauer-Leoni, 1986; Schubauer-Leoni & Leutenegger, 2002), involving self-observations, audio and video recordings, reflective work with students, and *post-hoc* interviews with teachers, allows participants to capture information about what is happening in the classroom.

The action and observation framework

This pedagogical and research innovation framework 'Predicting, Describing, and Observing' (Giglio & Perret-Clermont, 2012) comprises several components:

1. iterative pedagogical sequences designed by Giglio with the intention to: (a) provide a space in which students can create a musical object

in small groups and, in doing so, feel the need to develop solutions or acquire new knowledge; (b) conceive teaching moments linked to this production activity;
2. efforts from the teacher to pre-visualize the pedagogical scene and get prepared to observe it in a way that is sensitive to what is happening, especially with regard to unforeseen events. For this purpose, before each iteration of the sequence, the teacher writes down, as precisely as possible but relatively spontaneously, their preparation for this pedagogical action and how they envision its unfolding (anticipated difficulties from the class as a whole or from specific students, planned adjustments, tasks expected to be easy, hypotheses about student behavior, duration of the activity, etc.);
3. audio and video recordings of the lesson's progression, along with collection of written traces left by the students;
4. a 'mini recital' (also recorded) during which student groups perform their compositions in front of the whole class;
5. a reflection after the mini recital, in which the teacher engages in a discussion with the class. One of the students, equipped with a recorder like a radio or television host, goes around to each student asking them to comment on their experience (composition activity, use of existing resources and knowledge, group work, production, etc.);
6. the teacher then confronts their initial expectations and predictions (as documented) and what actually happened;
7. additionally, some teachers agreed to be interviewed, individually or in groups, while watching the recordings using an approach inspired by the Cross-Confrontation Interview method (Clot, Faïta, Fernandez & Scheller, 2001).

The iterative structure of pedagogical modules

Pedagogical modules were therefore gradually developed, consisting of an invitation to students, generally aged between 6 and 13, to create a melody or rhythm in small groups. These pedagogical modules attempt to reproduce, to a certain extent, the 'working' conditions of young people who have been observed outside the school composing in groups of budding musicians, appearing in mini recitals, developing their

comments in discussion circles, etc. The aim is to create an environment in which students are able to express themselves in their own way, in the form of a group of young people that resembles those observed outside the school. These modules comprise teaching phases aimed at broadening the students' knowledge and equipping them to deal with the difficulties they encounter when working in group to create a melody.

These pedagogical modules have taken a general iterative form (once phase 5 is completed, another activity follows, again beginning with phase 1, and aimed at building on the knowledge acquired in the first iteration), as follows:

Phase 1	The teacher introduces students to the activity to be performed: for example, the composition of a melody or a rhythm.
Phase 2	Students work in small groups to compose the melody or rhythm by using simple instruments available at school: synthesizer, antaras, panpipes, and percussion in Argentina; xylophones, pianos, and percussion in Canada (Figure 10.1, left side); recorder, guitars, and percussion in Brazil; and xylophones, metallophones, and percussion in Switzerland.
Phase 3	Mini-recital: the groups present their compositions (Figure 10.1, in the middle).
Phase 4	Discussion with the whole class: the teacher invites students to talk about their productions and to reflect on the ways they were working, e.g., how they mobilized the available resources and their previous knowledge (Figure 10.1, right side).
Phase 5	The teacher transmits (sometimes even in a very formal way) new knowledge in order to offer students new resources to enrich their future productions, their working methods, their awareness of what is at stake, and to solicit further reflections.
Phase 1	The teacher introduces students to a new activity (always aiming at creating a performance, a recital) by inviting them to mobilize the experience and knowledge acquired by the previous iteration.
Phase 2 again	(as described above)

Figure 10.1. Images of the different phases (2, 3 and 4–5) of a teaching module

Some examples of the observations collected

Here we present some of our observations in relation to our main research questions. These examples offer only a general overview of the richness and potentialities of the data corpus we have collected and analyzed by using our methodology[3].

Putting the student's creative activity at the center of the lesson: Yes, it is possible

As a first result, we observed that it is indeed possible, under certain conditions, to place the creative activity of groups of students at the center of the lesson (even when school furniture is not provided for this purpose). Students may succeed in creating a rhythm or melody and performing it in a variety of school contexts. Once the task is understood, students are really enthusiastic to produce a piece of music, to write it, and to perform it in front of the classmates. They can put the *object* at the center of the activity, as a fruit of their efforts.

The students' sound productions take different forms (see the examples given in Figure 10.2 for an illustration). We will focus here on their written productions (drafts of partitions) that denote various

3 In order to improve the intelligibility of the excerpts, we use the following symbols:
- each 2-second pause is indicated by a slash {// = 4 seconds}.
- the completion of a sentence or an explanation of the context is written in square brackets [].
- deleted passages that were considered not necessary for this chapter are signaled by two parentheses (...)
- the last syllables are indicated by suspension points ...

strategies adopted to face different kinds of technical problems (which the teacher may possibly take up again later in Phase 5). These difficulties do not prevent students from making progress in composing their musical.

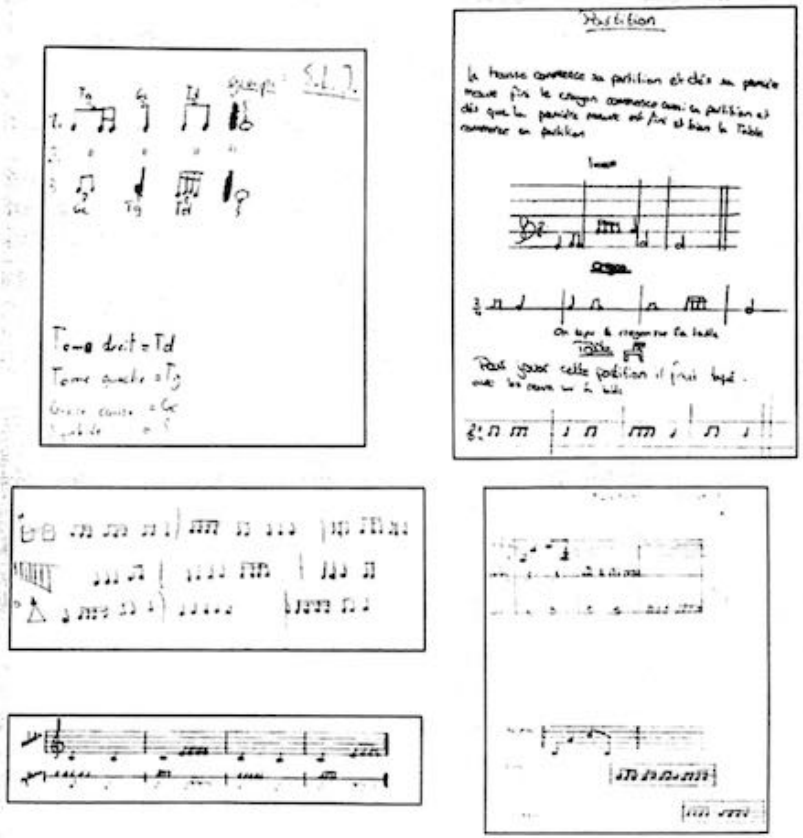

Figure 10.2. Examples of partitions drafted by students

However, while this module is not difficult to implement, it is not always obvious to all teachers and students to take this opportunity of using such a space to create. The setup of the module allows us to

investigate why this is the case, particularly through the notations that teachers have made regarding their expectations and predictions before the action. In the following sections we propose to observe what emerges from this investigation.

Teachers' predictions reveal fears they have that could have been paralyzing without support

Some teachers did not believe that such a pedagogical sequence could work in their classroom and approached it with hesitation and even significant apprehension. For instance, some teachers predicted that students (and consequently themselves) would encounter many difficulties during the music task dedicated to the composition of a melody or rhythm (Phase 2):

> At the beginning of the preparation, the students will be a little lost. I'll have to let them manage as much as possible on their own, but if I see that it's not working at all, I'll approach the group to help them. They might not get along very well in the group either, but they will have to agree quickly enough to be able to make a production at the end of the time limit. (Predictions of teacher Hélène, 11–12-year-old students in Switzerland)

> Once phase 2 has started, some groups may need to have the setpoint explained again. It will take a lot of time for the groups to get started and make decisions; maybe they will not want to spend time playing what they produce, or they will ask to present their creation from their table (phase 3), this problem will challenge me to find other ways to motivate them[4]. (Teacher Sergio's prediction, 12–13-year-old students in Argentina)

They also sometimes fear that phase 4 (i.e., the phase during which a teacher-led collective reflection aims to get students to reflect on the steps they have taken to compose the music) is not going well:

4 'Una vez iniciada la fase 2 quizás haya que volver a explicar la consigna a algunos de los grupos; a todos les llevará un tiempo empezar y tomar decisiones; tal vez no quieran pasar a tocar lo que produjeron o pidan presentarlo desde el banco (fase 3), cuestión que me va a desafiar para encontrar otras maneras de motivación'.

> I will have to be very careful with what I ask and how I acknowledge and build up to what students say: how can I read the partition? This time I hope that I will make myself understood by the students. I have the impression that it is difficult for them to reflect on what they are doing. (Predictions of teacher Hélène in Switzerland)

Other teachers, on the other hand, do not expect difficulties. We note, however, that these are often teachers who have already familiarized themselves with the process in previous iterations: in this respect, they have gained confidence. Our feeling is that the greater the space for creative initiative left to the students, the more the teachers fear the unexpected and, by consequence, perceives that the object will escape from their control. However, after a few tries, teachers begin to have a more accurate and informed idea of what might happen and, consequently, were reassured.

Students are committed to the task and strive for success

The object of the activity (the composition of a melody or rhythm) in Phase 2 seems to have been easily taken up by most students. The following excerpt presents a student's answer (collected during Phase 4) to our question 'How did you compose the piece of music together?'

The student Mateo (11 years old, Switzerland) states the following:

> [...] and then we each tried to do something that we thought was good and then we put it all together and we did it and then we made improvements. For example, I said, this is an example, I told Sacha that maybe we shouldn't do this, or do other things, we helped each other.

A classmate Laura (12 years old, Switzerland) continues:

> Well, actually, we worked a bit alone, we found partitions, we tried, we had to manage on our own for a while and then we tried to put everything together and then we, uh, we, uh, we took out what was too much, uh, where, uh... And put it down.

On the other hand, Phase 4, requiring a general discussion and a reflection on the process, is new for the students and its purpose is indeed much less clear and more abstract. As a consequence, students do not always understand what is expected of them. We asked students to tell

us how they thought about it and how they shared their experiences with the teacher and their peers.

Mateo said:

> We have no idea. No immediate idea. Because, well, we don't hear the questions directly, so they're complicated for the most part and we don't understand what to do. [...] because when someone understands, he starts to say, well it's more like repeating what he says, but with a little adjustment. [...] Uh, well, yeah, it's like she says, we copy a bit but with a bit of tweaking, but in fact maybe they didn't quite understand, well, for example, me the other time when we recorded, I didn't really understand, but I was saying what the others said, but adding a bit of what I thought. And when you hear yourself talking, you feel like saying yeah, you have to say that, and say that...

Mateo gives us a nice example of a student's effort to meet the teacher's expectations, trying to find a meaning for an imposed activity and looking to move forward (without understanding the directon taken). We obviously have to further reflect on this phase 4 whose object (to verbalize and conceptualize what happened) is probably not a 'real object' for the students.

Teachers positively surprised by students' attitudes and achievements

It is interesting to consider the difference between what teachers predict before the action and what they mention after the lesson. We refer to the case of teacher Sergio (working with 12 and 13 years old students): in his predictions he seemed to have no specfic concern, but many were present in his notes after the lesson. It seems that it is this reflection on what had happened that made him aware that he had been feeling very tensed:

> I felt pressured into thinking that everything was going to go wrong; I suffered, and I was uncomfortable, and I was looking for how I could save the situation. When the groups started to write their compositions, I thought that they hadn't understood anything, that I hadn't been able to explain the process to them and I expected the worst result. But it wasn't like that. When I started going through the groups, I noticed that they were working well and that the partitions emerged with creativity[5]. (Sergio's notes after the lesson)

This teacher, like others, is concerned by the possibility that students may not understand the goal of the activity. He wonders how he would be able to continue his pedagogical work in such an unpredictable situation. However, he finds that, contrary to what was expected, the students managed to create a partition and to perform it.

Teacher Hélène follows the same path:

> Contrary to what I thought, we started working very quickly without asking countless and unnecessary questions. Having a diagram on the board and the positions of the groups very far apart helped in this goal. (Helene's notes after the lesson)

New awareness and the pleasure of improving professional gestures

The analysis of the teachers' notes shows that their pre-lesson predictions are sometimes weak and give a relatively undifferentiated picture of the processes of interaction, collaboration, and learning that will be at stake. However, the notes written after the activity reveal an awareness of both their expectations and their behaviors. Of course, a discrepancy is particularly present among student teachers, although it applies to everyone (as the reality is always more complex, subtle, and unexpected than we imagine).

Karine, a pre-service teacher doing her training in a Swiss class with 6 and 7 years old students, is planning a lesson during which the students will be asked to create and perform a musical piece with a series of objects (papers, sticks, cans, etc.). Her intention is to facilitate the work of the groups and to empower the autonomy of the students engaged in the creative work.

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5 'Me sentí presionado creyendo que todo saldría mal, sufrí incomodidad y buscaba la manera de salvar la situación. Una vez que los grupos empezaron a escribir la composición creía que no habían entendido absolutamente nada. Y que yo no había sabido llegar con el escenario y esperaba el peor resultado'.

In her predictions, she writes the following:

> In group work, I will help the children only if they need me. I will let them do their trials and composition on their own; I don't want to influence them too much. I will still drop by to see how they do it. (Prediction of pre-service teacher Karine, in Switzerland)

But, after the lesson, she indicates in her notes what follows:

> [During Phase 2 of the pedagogical module devoted to the group composition], I can't help but intervene and try to encourage students in their discoveries in order to obtain the more results. (Notes from pre-service teacher Karine, after the lesson)

Karine notes that she had decided not to intervene during the students' creative activity. However, after the lesson, she realizes that she was not able to prevent herself to take part in the students' activity and to put her own ideas into it.

Concerning the reflective discussion with the whole class (Phase 4), Patricia, another pre-service teacher doing her training in a Swiss class with 7 and 8 years old students, predicts that children will learn from this activity:

> The children will tell us what they've discovered. This may lead to a discussion on this or that element that was raised... Then we will try to put musical terms to the elements that the children have highlighted. (Predictions of pre-service teacher Patricia, Switzerland)

After completing the lesson, Patricia writes the following:

> [during the discussion] the children explained to me what they had noticed in the workshops, but could not find a clear rule or explanation. (Notes from pre-service teacher Patricia after the lesson)

She thus becomes aware of her inappropriate expectations, which will subsequently enable the teacher to redefine her role. This awareness is facilitated by various elements of the teaching module: the effort to predict and then confront the reality; the existence of audio- and video-recordings that support the effort to reach an objectivity and make it possible to observe what actually happened; the opportunity offered

by the third party (the researcher or the trainer-researcher) to talk about it. In addition, it is important that the teacher is placed in an active and creative professional role. She is not asked to simply 'apply' the module, but she can test and modify it with the freedom to evaluate, if necessary, whether it suits her professional action or not. This freedom offered to the teacher to exploring his or her role, to creating and recreating it, to modifying, if necessary, some of the elements of the module, to adapting them to the resources (furniture, instruments, and other objects present), to intervening according to preference and interpretation of the students' needs, seems to play an important role. It is by endorsing his or her professional role that the teacher can fully engage in a critical examination of the activity in order to better achieve the teaching objectives. Pleasantly surprised by the creativity emerging during the activities in classroom and motivated by their own assessment of the students' needs, teachers can take pleasure in designing and proposing the activity, even gaining an improvement of their own professional skills.

Then, the teachers can discover, in a much more differentiated way, the nature of the activity in which the students are engaged, the difficulties for them, and the possible solutions.

Social interactions are not necessarily fruitful: On the need to learn how to organize them and bring in new knowledge in a judicious manner

It is not enough to put students in small groups so that they know how to work together. It is not enough for a teacher to want to help students to be efficient. In order to be fruitful, social interactions must be organized according to a certain architecture. But what is this architecture?

Thus, the teacher may notice, for example, that the expected 'group work' of the students is related to their ability to organize themselves, to allocate roles, to manage conflicts, to integrate the use of instruments, etc. The students should also understand the whole activity and agree on how to carry it out (e.g., by organizing subtasks). This may happen first by trial and error. A students' awareness of mistakes or *impasses* is gradually created by stumbling over specific problems. The solicitation of the teacher's help can support students in finding or adopting a solution. However, there is also the risk that, faced with difficulty, students may give up and leaving it to the teacher who, accordingly, will have to start again the activity.

A very frequent phenomenon in our corpus is the teachers' discovery of their tendency to intervene: there are too frequent actions and verbalizations which, even when intended to help students, are not functional to deserve the goal of leaving space for the students' agentivity. Many of the teachers are very surprised by this and declare themselves eager to make efforts to be into a 'silent withdrawal', with a pedagogical posture that is not passive, but 'contemplative'.

It is relevant to highlight that the more the teacher, from this posture, perceives the active buzzing of his or her students, the more the teacher becomes aware of the multiple roles he or she is likely to assume, as well as the knowledge to be transmitted to the students. However, this means that teachers may be confronted with their own limitations. For example, generalist teachers who often have little musical knowledge may become aware of their difficulties in continuing the lesson in Phases 4 and 5 of the module, which require them to have a precise expertise, and may therefore discover a need for continuing education:

> This time I hope that I will make myself understood by the students. I have the impression that it is difficult for them to reflect on what they are doing. It will be time for me to take up what the students have said, which is interesting, to do some theory. I am not at all sure what I am going to tell them. I hope I won't say too much nonsense. (Predictions of generalist teacher Hélène)

During an interview conducted after a series of implementations of pedagogical modules, the teacher Sergio (music specialist teacher) says the following:

> I was expecting other results // or to work from a more comfortable space, right? I worked with some discomfort but, in the end, I saw very good results [...] It was really a situation // (that concerned me) as a teacher, in that discomfort. The students // you can see that they understood well and that they were able to produce things and that was really the objective[6].

6 'Yo esperaba otros resultados//o trabajar en un lugar más cómodo que por ahí es el mío, ¿no? Trabajé con cierta/incomodidad, pero después yo vi muy buenos logros al final [...] Esta fue nada más que una situación verdaderamente//mía como docente/de esa incomodidad. Los alumnos//se ve que entendieron bien y pudieron producir cosas [...] ese era el objetivo/de última'.

He also explains that if he had to advise other colleagues on how to conduct such an educational module, he would tell them:

> [...] we should approach (groups) to see, well, to ask how it's going? Do you have any doubts? Look at every aspect of what you're working on. Look together. See how you can divide up the tasks in the group. And walk around the classroom, right? Don't stay in one place and expect the students to say, 'Okay, we're done'. Don't get too involved, say, without interfering too much. That is, we are together, we are present. We are working in groups, each group composes its own melody, but we are all involved in the same work [composing]. I don't know what else to say to them [...] Let them be sensitive, observing what [the students] show when they respond, when they comment on what they have worked... on [...] To see what suggestions to provide them for future work[7].

Conclusion

Taking on the role of teacher creatively

These pedagogical modules were able to give room for the creativity of the student. When the teacher implements such modules that give students the opportunity to produce a musical object together, and not only to listen to, read, or interpret it, we have found that some obstacles arise: it is not easy to compose and then write a melody and the teacher easily makes inappropriate interruptions in the students' work; it is not easy to get the students to talk to each other. Based on these findings,

7 'se vaya acercando para ver, bueno, preguntar ¿cómo están?, ¿tienen alguna duda?//Fíjense cada aspecto de lo que estén trabajando. Que lo busquen juntos. Que vean cómo se pueden repartir las actividades, dentro del grupo. E ir en el salón, ¿no? No quedarse en un solo lugar esperando que los alumnos le digan//bueno ya está, terminamos. Ir metiéndose sin intervenir del todo, digamos. Es decir, estamos juntos, estamos presentes. Estamos trabajando en grupos [distintas composiciones] pero, todos en un mismo trabajo [componer]. No sé qué otra cosa más le diría. Que esté sensible, observando lo que [alumnos] manifiestan cuando contestan, cuando comentan lo que han trabajado.... [...] Para ver qué sugerencias les hace para los próximos trabajos'.

the teaching modules were gradually adapted and now manage to offer the teacher and students different speaking times in order to encourage student agentivity in their relationship to music and classroom learning. The classical teacher's role has been disrupted and the teachers have had to learn to assume their role creatively in the face of a process that includes important unknow elements, i.e., what the students will create. Indeed, asking students to simply imitate and reproduce what the teacher does or knows is not scary: at most the risk is that the students will not succeed. While inviting their students to produce something new puts the teacher in a (relatively) unpredictable situation from the outset, since he or she does not know what children are going to do. Some teachers initially experience this openness towards the unknown as very unsettling, as they feel they have to be the 'masters' of the situation. In the current state of analysis of our corpus, this is one of the major lessons: the fear of the unexpected productions and behaviors of the students. But the process also shows that it can be tamed, step by step, as experience makes the 'unexpected' more 'expected'.

A framework for creating and learning: From teacher's silence to the teacher's word

The other fruit of the current exploration of the data is this discovery (which takes on a special significance in music teaching!): it is the importance of the teacher's *silence*. Silence that allows us to hear the music produced by the students. Silence that allows the student or group of students to be heard at work. Silence that allows the teacher to speak at the right time and to have more chances to be understood. And the silence of the trainer or researcher that allows the teacher (especially in front of the video, but also face to face with his or her own written predictions) to hear what has happened and to understand why it is often not what was foreseen.

We, authors of this chapter, are at the beginning of a research project that we are expanding to other educational fields. And, just like the students in front of their creations, and like the teachers when they can feel fully responsible for their (intriguing) professional action, we are overcome by a certain enthusiasm as trainers and researchers. Even though our pedagogical sequences and observation approaches still need development.

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