How *Making Thinking and Learning Visible in Italian Secondary Schools* Supports Transformative Learning in Teachers

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Doubt may be an unpleasant condition, but certainty is an absurd one.

-Voltaire

The MLTV approach demands that you have to work on yourself first.

-M. Gabbanelli (*MLTV* project teacher)

How can teaching and learning extend beyond the passive transmission of knowledge from teachers to students, to engage and inform others in and outside the classroom? How can educators shift the balance in classrooms to include a focus on creating as well as conveying knowledge, culture, and values? These were the overarching questions that Project Zero (PZ), a research center at the Harvard Graduate School of Education, and researchers from the Istituto Nazionale Documentazione Innovazione Ricerca Educativa (Indire)—the national public research institute responsible for innovation and dissemination of best practices in Italian public schools—investigated in a recent18-month collaboration called *Making Learning and Thinking Visible in Italian Secondary Schools* or *MLTV*.[1]

MLTV began in 2017 in order to explore how two long-standing Project Zero frameworks—*Making Learning Visible* (Giudici et al., 2001; Krechevsky et al., 2013) and *Visible Thinking* (Ritchhart et al., 2011)—could be adapted to support Italian public secondary school teachers in their move away from transmission-based teaching. Fifteen teachers, from three Italian secondary schools in an innovative network called *Avanguardie Educative*, acted as co-researchers[2] with PZ and Indire to: 1) support the creation of cultures of learning, thinking, and understanding in Italian classrooms, and 2) develop practices and tools that could be disseminated in Italy and perhaps elsewhere. *MLTV* resulted in a set of guidelines written by Indire, PZ, and the teachers to assist other Italian schools in the network interested in adopting the *MLTV* approach. The guidelines are available in Italian on Indire's *Avanguardie Educative* website.

In this working paper, we consider the notion that *MLTV* not only helps teachers rely less on transmissive teaching, but also supports transformative learning. First, we share the contextual background for the project, and give a brief overview of the frameworks and principles underlying the two frameworks that make up *MLTV—Making Learning Visible* and *Visible Thinking*. Next, we define transformative learning and its place in *MLTV*. We then discuss four propositions about how *MLTV* fosters transformative learning in teachers, with reference to the experiences of the fifteen project teachers:

1. *MLTV* asks teachers to see themselves as researchers into student learning.

2. *MLTV* does more than ask teachers and students to *do* things differently; it asks teachers to *know* students in a different way.
3. *MLTV* encourages collaborative sense-making through protocol-guided analysis of documentation.
4. *MLTV* provides discrete, manageable supports to assist teachers as they make the transition from transmitting knowledge to supporting students in constructing knowledge.

Background

The three schools in the study—I.I.S. Savoia Benincasa, in Ancona on the Adriatic Coast, I.S.I.S. Arturo Malignani, in Udine near the border with Slovenia, and I.S.I.S. Europa, located in Pomigliano d'Arco on the outskirts of Naples—were chosen based on the interest of the school leaders, their different courses of study, the high quality of instruction, and their geographic locations. The schools range in size from 1,600 to 3,000 students and serve students aged 14-19 years old. They cover the range of Italian upper secondary programs, including preparation for university and specialized preparation for employment (both technical and professional). I.I.S. Savoia Benincasa and I.S.I.S. Malignani were founding members of Indire's *Avanguardie Educative* network; I.S.I.S. Europa, joined the network in 2016. I.S.I.S. Europa serves students from low socio-economic backgrounds, while I.S.I.S. Malignani and I.S.S. Savoia Benincasa primarily serve students from middle-high socio-economic backgrounds.

School leaders, in consultation with the Indire research team, selected the fifteen teachers for this initiative. Selection criteria included interest in project ideas, ability to speak and understand English, and diversity of subject matter and grade levels. Teachers participated in three in-person workshops and six cross-school webinars co-led by PZ and Indire researchers. All meetings were audio-recorded and/or chronicled in detailed notes. Workshops introduced or elaborated on PZ ideas, practices, and tools, with discussions often grounded in documentation of student learning (e.g., examples of student work and reflections, audio- or video-recordings of classroom discussions and interactions, and partial transcripts). During the cross-site webinars, teachers and researchers also reviewed documentation from each school. These meetings were supplemented by monthly site visits by the Indire team. Visits typically entailed classroom observations, group discussions, meetings with the head teacher (the Italian term for a school leader), and occasional focus groups with students. In addition, each school regularly posted documentation of student work and activity resulting from the use of selected PZ tools or protocols on the online platform, *Padlet*.

The *MLV and VT* frameworks

MLTV combines Project Zero frameworks from the *Making Learning Visible* and *Visible Thinking* projects. The *Making Learning Visible (MLV)* framework draws attention to the power of the group as a learning environment and documentation of students' learning process through notes, student work samples, and video- or audio-recordings, as a way to see how and what the learners are learning. Yet more important than the documentation itself is what teachers or

learners *do* with the documentation in order to support learning. *Making Learning Visible* is based on collaborative research initially conducted by PZ researchers with educators from the municipal preschools in Reggio Emilia, Italy, and subsequently with preschool through secondary school educators in the United States. *MLV* defines a learning group as a collection of persons who are emotionally, intellectually, and aesthetically engaged in solving problems, creating products, and making meaning, in which each person learns autonomously and through the ways of learning of others (Krechevsky & Mardell, 2001).

Visible Thinking (*VT*) is an approach to teaching thinking that develops students' thinking dispositions, such as the inclination to be curious, open-minded, or thoughtful, while also deepening their understanding of content. *VT* offers simple, easy-to-use strategies for jumpstarting thinking and making it visible, called thinking routines. The *Visible Thinking* framework is based on decades of research at Project Zero and elsewhere that shows that the dispositional side of thinking—alertness to opportunities that call for thinking and the motivation to do so—is as important as the thinking skills themselves. *VT* researchers first identified high-leverage thinking moves (e.g., uncovering complexity or considering different viewpoints) likely to support the development of understanding across disciplines, and then developed thinking routines to foster these moves.

A number of fundamental principles underlie PZ frameworks such as *MLV* and *VT*:

- **Thinking is more than a matter of skill**; **it is dispositional and distributed** among individuals, groups, and cultural resources and artifacts. Thinking can be made visible through particular routines and practices. (Perkins et al., 2000; Tishman et al., 1994)
- **Learning is a consequence of thinking.** (Perkins, 1992)
- **Thinking and learning are fundamentally social endeavors.** (Bandura, 1977; Giudici et al., 2001; Krechevsky et al., 2013; Vygotsky, 1978)
- **Understanding means applying what one knows in new situations**. Knowledge and skill in and of themselves do not guarantee understanding. Understanding is something one *does* or *performs*, rather than *possesses*. (Perkins & Blythe, 1994)
- **Understanding requires prioritizing depth over breadth.** In order for students to develop understanding, they need to spend enough time with a topic to consider it from multiple perspectives and apply it to different situations. This inevitably means reducing the breadth of the content taught in service of studying fewer topics more deeply. (Gardner, 1999)
- **In order for classrooms to be cultures of thinking and learning for students** ("places in which a group's collective as well as individuals' thinking is valued, visible, and actively promoted as part of the regular, day-to-day experience of all group members"), **schools must be cultures of thinking and learning for adults** (places where deep and ongoing discussions of teaching and learning take place in service of enhancing students' and adults' thinking and learning). (Ritchhart, 2015, p. 31)

What is transformative learning?

Like many other *PZ* frameworks, *MLV* and *VT* are designed to support *transformative* as well as

technical learning. Technical learning refers to the application of proven knowledge and skills in practice; i.e., doing something *better*. Transformative learning refers to questioning fundamental assumptions and beliefs and developing new theories; i.e., doing something *different* (Mezirow, 2000). Although technical learning might offer a variety of ways to address a problem or goal, it does not question the goal itself. Certainly, there are technical aspects of *MLTV*, like using thinking routines to enhance particular types of thinking, or carefully considering the formation of small groups. However, the purpose of *MLTV* goes beyond having teachers use the tools and practices of *MLV* and *VT*. The goal is not for teachers to adopt particular practices, but to become clearer about why they do what they do (their underlying assumptions about how learning happens) and whether it is having the desired impact on student learning (that is, whether what they teach is in fact what students learn). The *MLTV* research team was interested in what the frameworks and tools allowed teachers to discover about student learning and whether those discoveries prompted teachers to reconsider what it means to teach, to learn, and to understand.

Initiatives like *MLTV* differ from reform efforts that pin improvement to the adoption of particular practices, sometimes chosen in a top-down process. Instead, *MLTV* proceeds from a theory of action that teachers improve by exploring core questions of teaching and learning in an ongoing and rigorous way. *MLTV* asks teachers to recognize and articulate their own theories of learning (about what is most important to learn, how best to learn it, and what learning looks like), and then to interrogate those theories. The process entails rethinking one's image of the teacher, the learner, and the school, creating opportunities for new theories to emerge and suggesting new ways to organize practice. We offer four propositions to describe how we believe *MLTV* supports teachers to engage in transformative learning—identifying and questioning fundamental assumptions about the nature of learning.

Four propositions

1. *MLTV* asks teachers to see themselves as *researchers into student learning*.

MLTV does not recommend best practices for teaching dilemmas. Instead, it aims to enhance teachers' ability to rigorously dig into their questions and uncertainties, and to develop evidence-based theories about what's effective or important. In other words, *MLTV* asks teachers to generate what Marilyn Cochran-Smith and Susan Lytle (1999) call *knowledge* of *practice.* In this conception of teacher learning, the assumption is that "the knowledge teachers need to teach well is generated when teachers treat their own classrooms and schools as sites for intentional investigation *at the same time* that they treat the knowledge and theory produced by others as generative material for interrogation and interpretation" (p. 250). Teacher learning is connected more to uncertainty than certainty, and more to problem-posing than problem-solving. Inquiry both starts from, and results in, questions.

The tools and practices of *MLTV* aim to help a teacher investigate such questions by paying close attention to how and what students think and learn, grounded in artifacts of thinking—i.e., documentation of students' learning *processes* as well as products. Over time, teachers play a central role in generating knowledge of practice by:

- making their classrooms and schools sites for inquiry,
- connecting their work to larger social, cultural, and political issues, and
- providing a thoughtful perspective on the theory and research of others.

The goal is not to "do research" or generate "findings" as such, as researchers in university and other settings are likely to do. Rather, the goal is to understand, articulate, and ultimately transform practice, social relationships, and even policies and structures in service of students learning and living meaningful lives (Cochran-Smith & Lytle, 1999). For example, based on his experience with *MLTV*, Santino Bandiziol, a teacher of technical subjects at I.S.I.S. Malignani, stopped giving grades on assignments and instead gives only feedback for improvement. A student's final grade for the course is no longer a calculation of grades earned throughout the term, but rather a reflection of the student's final understanding of the course material. Bandiziol adopted this new approach to assessment because, he says, what's important is the understanding students develop by the end of the term, not where they are at different points in the term.

Early in the project, several teachers resisted the idea that they were researchers. Seeing themselves as learners was not a part of the teaching role they were used to inhabiting. Even the notion that a teacher would have a question about teaching and learning that she could bring to her colleagues for their perspectives was unexpectedly difficult to convey. (They were more used to the practice of teachers sharing a successful lesson with colleagues.) The teachers diligently tried thinking routines with their students, but largely without having a specific pedagogical purpose in mind. The turning point for many is reflected by this exchange that came two months into the project[3]:

> *Teacher:* For the project we need to use thinking routines, but sometimes for my subject it's very difficult to use a thinking routine.
>
> *Researcher*: You don't need to use thinking routines for the project. The goal of the project is for a teacher to ask himself, "What's the thinking I want my students to take away?" Then you use a thinking routine if it will help. The same is true for documentation—we wouldn't say, "You should document." We'd ask, "What's something you are wondering about or want to understand better?" If you document just to document, you won't know what to do with it because there wasn't a clear purpose for collecting it.

Teachers came to see that they were an integral part of the research team, experimenting with tools and practices and adapting them to fit their context. They shared their findings about how the practices were more or less useful for their purposes, raised questions, and made refinements, all from the crucial perspective of someone actually in the classroom every day.

2. *MLTV* does more than ask teachers and students to *do* things differently; it asks teachers to *know* students in a different way.

Teachers saw *MLTV* as different from other pedagogies they used to foster active learning, such as *TEAL* (*Technology-Enhanced Active Learning*) and classroom debate, because rather than focusing on what students and teachers *did*, *MLTV* emphasized how and what students *learned. MLTV* helped teachers understand their students more fully as learners by asking them to pay attention not only to what students knew—their content knowledge—but also to how students

came to know what they knew. I.S.I.S. Malignani English teacher Caterina Gasparini noted, "I am more interested in [students'] thoughts and the reasons why they think like that. *MLTV* has taught me to observe and to listen more carefully to my students and to wonder about their way of learning." In addition, Gasparini thought the students themselves were becoming more interested in each other's thoughts, opinions, and products. This way of knowing students, which considers both the process and results of their thinking, led teachers to question their image of the learner in at least two ways.

First, collecting and collaboratively reviewing documentation created opportunities for teachers to put aside what they were expecting to hear from students, and instead to hear what students were actually thinking. Teachers reported that when they used *MLTV* practices to make thinking visible, they were often surprised by students' interpretations of a topic or ways of solving a problem. Raffaella Tomasini, an Italian teacher at I.S.I.S. Malignani, noted, "Students feel free to talk without worries, and so often they provide unexpected interpretations of the topic, pushing the discussion forward." In other words, *MLTV* helped teachers, and often students, appreciate the students themselves as a valid source of ideas and knowledge alongside such traditional authoritative voices as the teacher or the textbook.

Second, the thinking routines enabled teachers to understand student thinking in a new way. For Bandiziol, documenting and analyzing his students' responses to *Think-Puzzle-Explore* (a thinking routine) allowed him to notice three recurring problems: 1) students skipped over fully elaborating the problem and moved directly into trying to solve it (despite directions from Bandiziol to focus only on the elaboration); 2) students focused on marginal content (perhaps because of the complexity of the topic) instead of on fundamental concepts and skills; 3) students had trouble identifying basic sources of error. Bandiziol designed subsequent lessons to address these needs. He wrote: "In previous years I assumed, through…past experience, what the student uncertainties were. Using the *MLTV* techniques, now I learn from the direct voice of students about their doubts."

In the Italian educational system, student success is determined by a series of comprehensive exams, so teachers feel responsible for helping students master the expected content in their disciplines. After becoming more knowledgeable about students' learning processes, however, teachers placed new value on teaching powerful, generalizable thinking moves, such as using different perspectives to enrich understanding, even if it meant they sacrificed some of the content. As Tomasini succinctly put it, "You must have knowledge, but it isn't enough." Her colleague Anna Maria Fehl adjusted her planning method to begin from thinking goals instead of content goals. She also created new rubrics to assess thinking as well as content knowledge.

Tomasini took a risk by straying from the weight of tradition in the Italian department. In teaching *I Promessi Sposi*, a canonical Italian novel, she asked students to find characters in films or other books that were similar to the novel's characters. One student compared the noble friar in the novel to Vegetta, a character from the *Dragon Ball* Manga series. Tomasini was pleased: "They shared some characters I didn't know….This is a good thing—they had to really explain because it was something I didn't know before. They really had to understand the characters of the novel to do this work." At the same time, she was concerned that her colleagues would be shocked and think that she was putting the sacred together with the profane. "How do I

explain to my colleagues that this tells me that the students deeply understand the characters?... We have to be strong enough to tell the other teachers that everything must change. We have to be strong enough to defend our students."

3. *MLTV* encourages collaborative sense-making through protocol-guided analysis of documentation.

Joseph Raelin (2001), a scholar of work-based learning, maintains that reflection in the presence of trusted others makes people more willing to "confront themselves and create alternative interpretations of their construed reality" (p. 17). The discussion protocols[4] that guided *MLTV* teachers' joint analysis of documentation of student learning had three important qualities for supporting transformative learning: they offered psychological safety; they encouraged multiple perspectives; and they were grounded in evidence (Raelin, 2001). *MLTV* teachers credited protocol-guided collaborative analysis with creating an environment that nurtured such reflection on their own, sometimes unrecognized, assumptions. Angelo del Vecchio, a teacher of Italian at I.S.I.S. Europa, testified to the importance of such collaboration for his teaching: "I cannot structure good learning opportunities if I am alone. But if I am comparing different perspectives with colleagues, I can do this in a more informed way. We need to be a learning group, just as we ask to our students to be. We should model for the students."

One of the first things we asked *MLTV* teachers to do was to bring documentation that made student thinking or learning visible to a cross-site webinar. It soon became clear that the question of what thinking looks like was not at all obvious. One teacher brought three fifteen-second videos of students answering a question she posed. Another brought photographs of students carrying out a sequence of actions with captions explaining each photograph. They were understandable responses to our request. At the same time, they raised fundamental questions about what thinking and learning look like. Where is thinking is located—in a student's answer or test score, photographs of students' actions, a small group conversation, a mistake that has been corrected, or a student's reflection on what he or she learned? Might we learn something that is not represented in the learning product by making the learning process visible?

Protocol-guided conversations provided a structure for teachers to discuss such questions, grounded in documentation of student learning as a shared reference point. The protocols set out roles, behaviors, and language that created a safe and productive learning environment. They solicited curiosity rather than judgment, and included steps that encouraged all participants, not just the presenting teacher, to find implications for their work in the documentation being discussed (see Figure 1).

Protocol for Collaborative Analysis of Documentation

1. Presenting teacher provides brief context for documentation.
2. Group asks presenter clarifying questions.
3. Group looks at documentation in silence.
4. Group responds to the following questions while presenter is silent:
   - What do you see or hear in the documentation? Point to what makes you say that.
   - What questions does the documentation raise? (Presenter does not answer questions.)
   - What are the implications for teaching and learning and next steps for the presenter?
5. Presenter shares his or her take-aways.
6. Group members jot down at least one idea to use in their classrooms and share ideas with the group.
7. Group debriefs protocol and thanks presenter.

(adapted from Krechevsky, et al., 2013, p. 128)

Figure 1: Documentation Discussion Protocol

The protocols typically required the presenting teacher to remain silent during most of the conversation, creating the opportunity to listen carefully to disparate perspectives. The protocols also asked participants to ground their interpretations in the documentation, pointing out the elements that supported the claims they were making. Hearing alternative, evidence-grounded interpretations of the documentation pushed teachers to reexamine the soundness of their own interpretation, creating the cognitive dissonance that is a necessary precursor to change and learning. "It is an added value to be challenged," said I.S.I.S. Europa English teacher Josephine Iannone. "You have to make visible what seems evident to you," which sometimes led to the realization that what seemed evident to you was not as evident to others.

Before the project started, *MLTV* teachers were not used to meeting to talk about student learning. One of the more surprising moments occurred when teachers told us they had been meeting to discuss documentation. When we asked where and when they met, they responded that they did not meet in person. Rather, they shared documentation and commented on each other's work in *WhatsApp* or *Padlet.* Although we understood the appeal of the ease and timeliness of digital communication, we nonetheless encouraged teachers to schedule monthly face-to-face meetings for protocol-guided discussions.

Teachers found the protocol-guided conversations to be qualitatively different from their digital exchanges. Del Vecchio credited the protocol with "making space for silence," and thus thinking. Such space can be hard to come by in the digital environment, with its constant barrage of messages, alerts, and content. I.I.S. Savoia Benincasa computer and robotics teacher Andrea Cesetti was skeptical about the conversations at first. But he grew to value them because the protocols helped everyone take something useful away from the discussion, unlike digital communication, where teachers were more likely to comment on the work of others without

making a direct connection to their own context. Perhaps the most significant benefit of regularly meeting in person to analyze student learning, according to Savoia Benincasa head teacher Alessandra Rucci, was that teachers became "a true learning group" and part of something bigger than themselves. Over time, *MLTV* teachers overwhelmingly agreed that meeting face-to-face with colleagues to share documentation was central to understanding student learning; it offered a depth and relevance that rarely were possible through online sharing.

4. *MLTV* provides discrete, manageable supports to assist teachers as they make the transition from transmitting knowledge to supporting students in constructing knowledge.

Before *MLTV* began, project teachers were already in the process of shifting the balance in their classrooms from transmissive to more constructivist teaching. Many had been early adopters of previous *Avanguardie Educative* initiatives aimed at increasing student-led learning. However, even teachers who wanted to make the shift sometimes found it challenging. Transmissive and constructivist teaching and learning are not an either-or proposition. Part of the challenge is knowing when providing information to students will push learning forward, and when it may deprive students of an opportunity to build their own knowledge in a more lasting way. Even when teachers want to lecture less, they may not always have practices at the ready to replace the lectures, or time to develop alternatives. *MLTV* provides concrete supports in the form of *structures, routines, roles,* and *artifacts* to assist teachers in following through on their intentions to move away from a transmission model of teaching; it helps teachers avoid reinventing the wheel.

The structure of the group: Transmission-based teaching rests on assumptions that learning is an individual endeavor and knowledge is an established entity that can be handed from person to person. Approaches like *MLTV* are grounded in different assumptions—that learning is fundamentally social as well as individual, and knowledge is constantly being constructed and reconstructed (see, e.g., Gergen, 2015; Vygotsky, 1978). Thus, *MLTV* asks teachers to be more intentional about designing and sequencing individual, small-, and whole-group learning. For example, teachers consider questions about group structure (*should the group be teacher- or student-directed? how many members are optimal for the task? should new groups form for each activity or stay together for longer?*) and group membership (*should groups be composed of students who have complementary skills, who are friends, or who are randomly assigned?)* in their planning. Although such planning takes time, it enables teachers to design learning activities in which they can fruitfully step away from the front of the class.

Initially, *MLTV* teachers tended to use the group as a way for students to generate individual responses to an assignment, after which the group would choose one individual response to represent it. Later, teachers began asking group members to generate a collective response, which often yielded a qualitatively different kind of learning. Teachers were often surprised at the breadth and depth of students' thinking when they gave students more time to learn from and with each other, without the teacher's intervention. It is important to note that cooperation is not the same as collaboration in the functioning of a learning group. Cooperation tends to emphasize getting along, being helpful, and taking an assigned role in a group. Although cooperation can be valuable, collaboration that draws students into direct engagement with each other's ideas and

ways of thinking as they work together to solve problems and make products often provides a more powerful environment for thinking and learning (Krechevsky & Mardell, 2001).

Scaffolding from routines: Thinking routines are an effective and efficient way for students to engage with each other's ideas. Designed to be used out of the box, the routines provide ready activities for teachers looking for an alternative to lecturing. Typically, teachers begin by using the routines as stand-alone activities, gradually incorporating them into more regular use. The routines separate the thinking process into manageable components, such as building explanations, uncovering complexity, and reasoning with evidence; they also help teachers understand how such thinking moves interact. For some *MLTV* teachers, routines like *See-Think-Wonder*, *Connect-Extend-Challenge*, *Headlines*, and *Step Inside* became go-to routines, perhaps because of their versatility and simplicity.

The routines also provided teachers with precise language to access student thinking. One immediate result was that teachers could more accurately assess which types of thinking students needed support in developing. For example, several teachers noticed students struggling with the *Wonder* portion of the *See-Think-Wonder* routine, which alerted them to an area that needed attention. Teachers also found they didn't need to talk as much when using the routines. Because they had at hand focused language for talking about thinking, their explanations could be shorter. In this way, the routines helped to reduce excessive teacher talk, a hallmark of transmission-oriented teaching.

In addition, the language of the routines, such as *What makes you say that?* or *What does it make you wonder?*, tended to seep into classroom discourse outside of the routines themselves. Such language assisted teachers and students in moving away from a stance of judgment and evaluation toward one of curiosity and inquiry. Of course, thinking routines are not a magic pill for curing transmissive tendencies. Teachers sometimes continued to direct students to a "right answer," even when the thinking routine was designed to be open-ended (e.g., wanting students to "see" something in particular when using *See-Think-Wonder*, and feeling the routine didn't go well unless students voiced particular responses). Over time, however, teachers became more aware of this tendency and came to see the routines as a critical support for engaging students in creating, rather than simply receiving, knowledge.

Blurring the roles of teacher and learner: In transmissive classrooms, the roles are clear-cut. The teacher's role is to provide knowledge; the student's role is to take in the knowledge presented by the teacher. In contrast, the structures and routines of *MLTV* brought students into engagement with each other, not with just the teacher, and required students to actively contribute to a shared body of knowledge. *MLTV* asks both teachers and students to step into roles that are inconsistent with transmissive teaching.

Loris Malaguzzi, the founder of the Reggio Emilia approach, said, "The aim of teaching is not to produce learning, but to produce the conditions for learning" (Rinaldi, 2006, p.137). Part of the teacher's role in this view is setting up the conditions for students to learn from and with each other. ***Before*** a learning experience, teachers might consider the time, space, materials, and questions that will facilitate group learning; clarify their learning goals and the *types of thinking* that students will need to engage in; identify thinking routines or other strategies to make

students' thinking visible; and consider when to use individual or group learning. ***During*** the learning experience, teachers become "guides on the side." They listen, observe, document, facilitate, provoke, coach, and serve as a resource to support student learning. ***After*** the learning experience, teachers review documentation (with others, if possible) to investigate what students learned, what was challenging, what engaged their emotions, possible misconceptions, and where to go next.

MLTV encourages teachers to continually ask themselves which of their teaching moves could profitably be turned over to students. For example, as one of her first *MLTV* activities, Gasparini asked students to work in trios to compose norms to guide class interactions. After the students shared their norms, Gasparini categorized the norms herself. Near the end of the project, students again worked in trios to compose headlines to capture the gist of an article. This time, Gasparini asked the students to categorize the headlines according to themes. Although a small shift in behavior, this was a significant reassignment of the cognitive work of the class. Over the course of *MLTV*, teachers increasingly referred students to each other rather than answer questions or respond to comments themselves. This rearrangement of roles seemed to reflect a fundamental shift in teachers' beliefs about what it means to teach, and who is authorized to do so.

Grounding teacher research in artifacts of documentation: A teacher experimenting with a new way of teaching might reasonably ask herself, "How do I know if I'm being effective?" *MLTV* offers a methodology for making this determination—the documentation process. *MLTV* defines documentation as *the practice of observing, recording, interpreting, and sharing through different media the processes and products of learning in order to deepen learning* (Krechevsky et al., 2013, p. 59). Many people think of *documentation* as an official record or evidence of an experience or event. However, in the *MLTV* framework, documentation is not just a record of what happened, but also an analysis or interpretation of the learning that took place. Hence, documentation is not just retrospective, but also prospective; it informs future learning.

Documentation allows teachers (and sometimes students) to explore the complexities of particular learning moments by grounding discussions in a shared artifact of learning. The basic premise of collaborative analysis—that different interpretations of one artifact are not only possible, but desirable for building a robust understanding of the thinking behind the work—challenges the assumptions of transmissive teaching. Moreover, in order to document, a teacher needs to step back in the learning process to note and make a record of what is happening. Stepping back means delaying intervention. Similar to the construct of wait time, delaying intervention carves out time for students to engage with the content and to develop their thinking without being told by the teacher what to think. Teachers also find that sharing documentation back with students can often slow down and deepen the learning process.

Concluding thoughts: From transmission to transformation

The overarching questions guiding the *MLTV* project focus on moving away from transmission-heavy teaching to creating cultures of thinking and learning in classrooms. Such a move requires that teachers and students reconsider fundamental questions about teaching and learning: How do we learn, and how do we foster learning in others? What does it mean to understand, and what is

most important to understand today and tomorrow? Over the course of the project, we identified four features of *MLTV* that seemed particularly powerful in encouraging teachers to examine these questions. Acting as researchers into learning, paying close attention to students' learning processes as well as products, engaging in collaborative sense-making, and making use of structures, roles, routines, and artifacts that support knowledge construction all helped teachers to surface their existing assumptions, examine them against the possibilities highlighted by *MLTV,* and suggest some ways forward.

However, if the move away from transmissive teaching is to be effective, students too may need to question their assumptions, values, and beliefs about learning. In several focus group interviews, the Indire research team found that, despite students' engagement with thinking routines, many of them continued to seek a "right answer" to confirm that what they had learned was in fact correct. These students sought an authoritative person to validate their thinking, not trusting what they came up with from their own discussions until they checked with a teacher or a textbook. For other students, though, the new approaches to learning seemed to be taking hold. Imperatrice Natale, an economics teacher at I.S.I.S. Europa, noted, "The students' learning process is starting to begin from asking questions, rather than from having to give answers [to my questions]." An area for further inquiry is whether and how approaches like *MLTV* might support the transformation of *student* beliefs about learning.

Perhaps the most compelling indicator of teachers' perception of the transformative power of *MLTV* is the urgency they felt to share this approach with other adults—teachers and sometimes parents—in their own and other schools. On a survey of potential impacts on teacher thinking and classroom practice, the statement that teachers agreed with most strongly was, "I am highly motivated to share this work with colleagues." Even before the end of the school year, teachers in all three schools took the initiative to share the work with the larger faculty. At the end of the project, Bandiziol, a veteran teacher wrote, "I have learned more about my job in these last two years than in the previous thirty-eight." His colleague Tomasini added, "When I was young, I wanted to change the world. To tell the truth, I never really gave up on this idea and *MLTV* puts me back on the right path."

Notes

1. Project Zero's mission is to understand and enhance thinking, learning, and creativity, in and across disciplines, for individuals and institutions. Much of PZ's work focuses on bridging the gap that often separates theory from practice. Indire has a growing network of over 800 schools called *Avanguardie Educative* serving students from 6 to 19. These schools are trying to revolutionize the way teaching and learning occur in Italy and move from a transmission model of schooling to a system that prepares students to thrive in a constantly-changing knowledge society.

2. *Co-researchers*, here, indicates that participant teachers were considered to be investigators and contributors of knowledge along with the outside researchers.

3. English was the primary language used between teachers and researchers in the project. Most of the quotations in this paper directly present the teachers' words as recorded in notes or recordings. Occasionally, the quotations are translations from Italian to English provided by the Italian researchers and teachers.

4. Discussion protocols provide structures for conducting focused and productive conversations among students or adults. In general, discussion protocols consist of a series of steps designed to support purposeful and inclusive conversations about student or teacher work (Blythe & Allen, 2016).

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