

Forward – by David Perkins

“How much remains to be revealed when we hear just half a conversation?” p. xiii

“We do not generally hear other people’s thinking, just the results of their thinking – an idea, an opinion, a plan. The messiness of ‘what if,’ ‘on the other hand,’ ‘but I worry that,’ or even just ‘my gut says’ all happens on the other end of the line.” p. xiii

“A coach, besides having expertise the athlete does not, can pay attention in ways the athlete cannot – from the outside and without having to perform physically at the same time.” p. xiv

“externalizing processes of thought so that learners can get a better handle on them.” p. xiv

“Thinking with is two important steps beyond just knowing information, the focus of far too much education. One step beyond is thinking about a topic, often interesting and valuable but in itself leading toward rather specialized understandings.” p. xiv

“The better people think about and with what they know, the more likely they will be able to make sense of the half conversations we all encounter.” p. xv

Preface

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“Developing a culture of thinking, we had noticed in our earlier research that as teachers worked with thinking routines in earnest and over time, they soon found themselves thinking about the other cultural forces at play; most notable time, language, opportunities, and interactions.” p. xviii

“Take risks in your teaching. Most of all, have confidence in every learner’s ability to think and your capacity to nurture that thinking.” p. xx

Acknowledgements

“It is important to nurture thinking in the daily lives of learners and to make it visible so that a culture of thinking can be built and a strong learning community established in organizations, in schools, and in classrooms.” p. xxi

About the Authors

“The thread running through all of Ron’s work as an educator and researcher has been and continues to be the importance of fostering thinking, understanding, and creativity in all settings of learning.” p. xxv

“A quality education is about much more than scores on tests; it is about who students become as thinkers and learners as a result of their time in schools.” p. xxv

Karen Morrison’s “work has focused on providing the environment and structures needed to support deeper thinking and greater understanding and engage students in learning in a relevant and meaningful way.” p. xxvi

Chapter 1 Unpacking Thinking

“If we want to support students in learning, and we believe that learning is a product of thinking, then we need to be clear about what it is we are trying to support. What kinds of mental activity are we trying to encourage in our students, colleagues, and friends? When we ask teachers in workshops, ‘What kinds of thinking do you value and want to promote in your classroom?’ or, ‘What kinds of thinking does that lesson force students to do?’ a large percentage of teachers are stumped. They simply haven’t been asked to look at their teaching through the lens of thinking before.” p. 5

“Our colleague Steve Seidel (1998) has written about both the importance and challenge of description when **looking at student work**. Because the mind is designed to detect patterns and make interpretations, slowing it down to fully notice and just describe can be extremely challenging.” p. 7

“It makes little sense to talk about thinking divorced from context and purpose.” p. 7

“Rather than concerning ourselves with levels among different types of thinking, **we would do better to focus our attention on the levels or quality within a single type of thinking**. For instance, one can describe at a very high and detailed level or at a superficial level. Likewise, one can simply test something out to determine if it will fail, or one can fully test the limits and conditions of that failure. Analysis can be deep and penetrating or deal with only a few readily apparent features.” p. 7

“We might consider **understanding** not to be a type of thinking at all but an **outcome of thinking**.” p. 8 “learning mathematics for understanding is fundamentally a different task than memorizing procedures.”

“Perhaps a better place to start is with the purposes of thinking. **Why is it that we want students to think? When is thinking useful? What purposes does it serve?**” p. 8

“Understanding isn’t a type of thinking one does but is in fact a chief goal of thinking.” p. 8

“**In most schools settings, educators have focused more on the completion of work and assignments than on a true development of understanding.**” p. 9

“Classrooms are too often places of ‘tell and practice’”. p. 9

“Retention of information through rote practice isn’t learning; it is training.” p. 9

“If designed well some of these activities can lead to understanding, but **too often the thinking that is required to turn activity into learning is left to chance.**” p. 9

“When classrooms are about activity or work, teachers tend to focus on what they want their students to do in order to complete the assignments. These physical steps and actions can be identified, but **the thinking component is missing. When this happens, the learning is likely to be missing as well.**” p. 10

p. 10 Exercise to identify Possible Discrepancy between Student Activity and Teaching

1. The actions students in your class spend most of their time doing. What actions account for 75 percent of what students do in your class on a regular basis?
2. The actions most authentic to the discipline, that is, those things that real scientists, writers, artists, and so on actually do as they go about their work.
3. The actions you remember doing yourself from a time when you were actively engaged in developing some new understanding of something within the discipline or subject area.

The extent your first list – what students spend the bulk of their time doing – matches the other two lists, your class activity is aligned with understanding. If the three lists seem to be disconnected from one another, students may be more focused on work and activity than understanding. **They may be doing more learning about the subject than learning to do the subject.**

“We need to be aware of the kinds of thinking that are important for scientists (making and testing hypotheses, observing closely, building explanations...), mathematicians (looking for patterns, making conjectures, forming generalizations, constructing arguments...), readers (making interpretations, connections, predictions...) historians (considering different perspectives, reasoning with evidence, building explanations...), and so on, and make these kinds of thinking the center of the opportunities we create for students. Furthermore, these kinds of thinking need to be among the primary expectations we hold for students: that they can and that they will engage in the kinds of thinking necessary to build disciplinary understanding.” p. 10

“David Perkins, Shari Tishman, and Patricia Palmer set themselves the task of trying to identify a short list of high-leverage thinking moves that serve understanding well. Their goal was not to come up with all the different kinds of thinking that were involved in understanding but to identify those kinds of thinking that are essential in aiding our understanding.” p. 11

1. Observing closely and describing what’s there
2. Building explanations and interpretations
3. Reasoning with evidence
4. Making connections
5. Considering different viewpoints and perspectives

6. Capturing the heart and forming conclusions.
7. Wondering and asking questions
8. Uncovering complexity and going below the surface of things

“If one were only to look at new ideas or situations from a single perspective, we would say that one’s understanding was limited and sometimes even biased. **Awareness of the different perspectives or takes on an idea gives us a more robust understanding.**” p. 12

“We know that **when our curiosity is sparked and we have a desire to know and learn something, our engagement is heightened.**” p. 13

“**The questions we ask at the outset of a learning journey change, morph, and develop as that journey moves forward. Even after extensive efforts to develop understanding, we find that we may be left with more questions than when we started. These new questions reflect our depth of understanding.**” p. 13

“In this complexity lay the richness, intrigue, and mystery that engage us as learners.” p. 13

“Structured reflection – that is, reflection that goes beyond voicing one’s opinion or feelings – involves describing the object of reflection and noticing its key features, connecting what is new to what one already knows, and examination of the event or object of reflection through various lenses or frames, which is prespective taking (Colby, Beaumont, Ehrlich, & Corngold, 2009)”. p. 14

“Some additional types of thinking we haven’t mentioned that seem useful in the areas of problem solving, decision making, and forming judgements include:” p. 14

1. Identifying patterns and making generalizations
2. Generating possibilities and alternatives
3. Evaluating evidence, arguments, and actions
4. Formulating plans and monitoring actions
5. Identifying claim, assumptions, and bias
6. Clarifying priorities, conditions, and what is known

“By being clearer in our own minds as teachers about the kinds of thinking we want our students to do, we can **be more effective in our instructional planning.** We can create opportunities for the kinds of thinking we value and want to make an expectation in our classrooms. Being clear about the thinking students need to do to develop understanding or to solve problems effectively allows us to target and promote those kinds of thinking in our questioning and interaction with students.” p. 15

“It’s one thing for us as teachers to articulate the kinds of thinking we are seeking to promote; **it is another for students to develop a greater awareness of the significant role that thinking play in cultivating their own understanding.** The important function of this awareness is highlighted by

Biggs (J. B. Biggs, 1987), who stated, ‘To be properly metacognitive, then, students have to be realistically aware of their own cognitive resources in relation to the task demands, and then to plan, monitor, and control those resources’ (p. 75). Biggs refers to this awareness of one’s own learning processes and one’s control over them as ‘meta-learning,’ a subcomponent of metacognition. Others have labeled it ‘meta-strategic knowledge,’ that is, knowledge about the strategies one has at one’s disposal to facilitate and direct one’s own learning (Zohar & David, 2008).” p. 15

“How does one uncover students’ thinking about thinking? How does one unearth their conceptions of what thinking is and the mental moves it encompasses? How can this be done in an open way that captures individual responses and growth over time rather than constraining students’ responses to a predetermined set of categories?” p. 16

“Students don’t have much knowledge of the strategies they might employ to facilitate and direct their thinking. Without this knowledge, they are likely to be less effective, less independent, less engaged, and less metacognitive as learners.” p. 17

“To the extent that students can develop a greater awareness of thinking processes, they become more independent learners capable of directing and managing their own cognitive actions.” p. 22

Chapter 2 Putting Thinking at the Center of the Educational Enterprise

“We judge teaching effectiveness based on student absorption of material, and teaching becomes defined as the delivery of that material. The education system becomes distorted, being more concerned with producing effective test takers than successful learners (Gallagher, 2010).” p. 25

“With the learner at the center of the educational enterprise, rather than at the end, our role as teachers shifts from the delivery of information to fostering students’ engagement with ideas. Instead of covering the curriculum and judging our success by how much content we get through, we must learn to identify the key ideas and concepts with which we want our students to engage, struggle, question, explore, and ultimately build understanding.” p. 26

“The literature on teacher change suggests that this shift from a focus on teaching to that of learning is a central aspect of many teachers’ professional growth and integral to the process of learning to be an effective practitioner (Hatch, 2006; Intrator, 2002, 2006; McDonald, 1992; Palmer, 1998).” p. 26

“As teachers interested in both students’ learning and understanding, we have two chief goals: (1) creating opportunities for thinking and (2) making students’ thinking visible.” p. 26

“In his book *Smart Schools*, our colleague David Perkins (1992) makes a case for the importance of developing opportunities for thinking: ‘Learning is a consequence of thinking. Retention, understanding, and the active use of knowledge can be brought about only by learning experiences in which learners think about and think with what they are learning... Far from

thinking coming after knowledge, **knowledge comes on the coattails of thinking. As we think about and with the content that we are learning, we truly learn it**’ (p. 8).” p. 26

“**When we reduce the amount of thinking we ask of our students, we reduce the amount of learning as well.** To make sure thinking isn’t left to chance and to provide us with the information we need in order to respond to students’ learning needs, we must also make their thinking visible.” p. 27

“Making students’ thinking visible becomes an ongoing **component of effective teaching.**” p. 27

p. 28 Demo – “In a unit on density, students watch as the teacher drops two candles of equal diameter, one short and one long, into two containers of liquid. The shorter candle floats while the larger candle sinks. Students are asked to write what they observed and explain why the event they witnessed happened. In doing so, students are encouraged to develop and put forth theories of explanation drawing on their scientific knowledge. Thus, at the outset students’ thinking is surfaced through their words and drawings. The teacher then removes the candles from the two containers and switches them. This time the larger candle floats and the smaller one sinks; an unexpected outcome for most students. Again, students are asked to write about what they observed and to develop an explanation. Students then share their reactions and discuss how the simple experiment changed where they focused their attention. As the discussion unfolds, students become aware that though both liquids appear the same, they must differ in some respect and that sinking or floating is not a matter of simple linear causality in this instance but depends on the relationship between the liquid and the object placed into it.”

“The teachers allow students’ nascent theories to be the object of continual discussion, justification, and refinement, thus **putting students in charge of developing their understanding and not merely providing them with information to memorize for the test.**” p. 28

“**When we demystify the thinking and learning process, we provide models for students of what it means to engage with ideas, to think, and to learn. In doing so, we dispel the myth that learning is just a matter of committing the information in the textbook to one’s memory. Schools no longer is about the ‘quick right answer’ but about the ongoing mental work of understanding new ideas and information.**” p. 28

“**Vygotsky (1978)**, writing about the importance of the sociocultural context of learning in providing models, stated, ‘**Children grow into the intellectual life of those around them**’ (p. 88). What kind of intellectual life are we presenting to our students in our individual classrooms and in our school as a whole? What are my students learning about learning? What messages am I sending through the opportunities I create for my students about what learning is and how learning happens?” p. 28

“**The students in our charge need to see an image of us as thinkers and learners** that they can imitate and learn from. They need to see and hear others’ perspectives, insights, and questions as

they advance in their own understanding. Students need to see how others plan, monitor, and challenge their own thinking in ways that move them forward. Students need to see that all learners make mistakes and that learning often occurs from reflecting on those mistakes.” p. 29

“A quality education is also about the development of the habits of mind and thinking dispositions that will serve students as learners both in our own classrooms and in the future (Costa & Kallick, 2009; Ritchhart, 2002).” p. 29

“As Ellin Keene (E. Keene & Zimmermann, 1997) notes, until students can name a process they cannot control it.” p. 29

“Once teachers start noticing and naming thinking, that is, making it visible, they as well as their students become more aware of thinking and it becomes difficult not to notice it in the future (Harre & Gillet, 1994).” p. 29

“I like how you have used your prior knowledge and what you already know to really build explanations of what is going on in these photographs. You’ve really looked closely and used evidence to back up your reasons.” p. 30

“A more flexible way of approaching the issue of questioning would be to think about how we as teachers can ask questions that (1) model our interest in the ideas being explored, (2) help students to construct understanding, and (3) facilitate the illumination of students’ own thinking to themselves. Each of these represents not so much question types – though they may be classified this way – as they represent goals we have as teachers: to model intellectual engagement, to support students in constructing understanding, and to help students clarify their own thinking. In contrast, a lot of the questions asked in classrooms are about testing students’ memory of what was taught. Such questions do not engage learners with ideas; they merely review content.” p. 31

“Asking authentic questions – that is, questions to which the teacher does not already know the answer or to which there are not predetermined answers – is extremely powerful in creating a classroom culture that feels intellectually engaging.” p. 31

“Kathy Hanawalt at Clover Park High School in Washington State uses a set of essential questions to focus her students on the fundamental issues of truth, perspective, and universality that lie at the heart of history and literature. What’s the story? What’s the other story? How do you know the story? Why know/tell the story? Where’s the power in the story?” p. 32

“Students’ authentic questions are a good measure of their intellectual engagement.” p. 32

“When teachers focus on making thinking valued and visible in their classrooms, their questioning shifts away from asking review or knowledge-based questions to asking more constructive questions. Constructive questions can be thought of as those that help to advance

understanding. These are questions that ask students to connect ideas, to make interpretations, to focus on big ideas or central concepts, to extend ideas, and so on.” p. 32

“Constructive questions act, not as nice add-ons to make sure some so-called higher-order thinking is happening, but as the guideposts and goals for the lesson itself. Teachers who ask constructive questions do so because they want to guide, direct, and push forward students’ understanding of important ideas.” p. 33

“What makes you say that?” p. 34

“In the reflective toss, the teacher’s first goal is to try to ‘catch’ students’ meaning and try to understand their comments. If meaning can’t be grasped immediately, then a follow-up question, such as ‘Can you say more about that?’ or ‘I’m not quite following you, can you say what you were thinking in a different way?’ is asked. Once the meaning is grasped by the teacher, then the teacher ‘tosses’ back a question that will push the student to further elaborate and justify their thinking, both to the teacher and to themselves.” p. 35

“It is one thing to ask good questions, but one also has to listen for the answers.” p. 36

“Listening conveys a sense of respect for and an interest in the learner’s contributions. When this is present, student are more willing to share their thinking and put forth their ideas, just as we as adults respond more when we know the person we are talking with its interested in us and our lives.” p. 37

“Our listening provides the opening for students to make their thinking visible to us because there is a reason to do so.” p. 37

“Another tool for making students’ thinking visible is the use of documentation: recording of the class’s investigation on the whiteboard, photographs of students working, audiotapes of the class discussion, written notes of students’ ideas and contributions, students’ paper and drawings, and so on.” p. 37

“Documentation must serve to advance learning, not merely capture it. To capture and record students’ thinking, teachers must be vigilant observers and listeners. When teachers capture students’ ideas, they are signaling that those ideas and thought have value and are worthy of continued exploration and examination.” p. 38

“Documentation ... provides a stage from which both teachers and students may observe the learning process, make note of the strategies being used, and comment on the developing understanding. The visibility afforded by documentation provides the basis for reflecting on one’s learning and for considering that learning as an object for discussion. In this way, documentation demystifies the learning process both for the individual as well as the group, building greater metacognitive awareness in the process.” p. 39

Chapter 3 Introduction to Thinking Routines

“Routines can be thought of as any procedure, process or pattern of action that is used repeatedly to manage and facilitate the accomplishment of specific goals or tasks.” p. 45

“Teachers who are successful at promoting students’ thinking tend to develop, adapt, and make use of specific routines to scaffold and support students’ thinking (Ritchhart, 2002).” p. 45

Types of Thinking to Promote Understanding p. 45

1. Observing closely and describing what is there
2. Building explanations and interpretations
3. Reasoning with evidence
4. Making connections
5. Considering different viewpoints and perspectives
6. Capturing the heart and forming conclusions
7. Wondering and asking questions
8. Uncovering complexity and going below surface of things

“As teachers we must first identify what kind of thinking we are trying to elicit from our students and then select the particular thinking routine as the tool for that job.” p. 46

“Thinking routines are tools that students can use to support their own thinking.” p. 46

“Routines are designed not to elicit specific answers but to uncover students’ nascent thinking around the topic. This sends the message that learning is not a process of absorbing others’ ideas, thoughts, or practices but involves uncovering one’s own ideas as the starting point for learning. Learning then becomes about connecting new ideas to one’s own thinking.” p. 49

Chapter 4 Routines for Introducing and Exploring Ideas

- See-Think-Wonder
- Zoom In
- Think-Puzzle-Explore
- Chalk Talk
- 3-2-1 Bridge
- Compass Points
- The Explanation Game

Chapter 5 Routines for Synthesizing and Organizing Ideas

- Headlines
- CSI: Color, Symbol, Image
- Generate-Sort-Connect-Elaborate: Concept Maps

- Connect-Extend-Challenge
- The 4C's
- The Micro Lab Protocol
- I Used to Think..., Now I Think...

Chapter 6 Routines for Digging Deeper into Ideas

- What Makes You Say That?
- Circle of Viewpoints
- Step Inside
- Red Light, Yellow Light
- Claim-Support-Question
- Tug-of-War
- Sentence-Phrase-Word

Chapter 7 Creating a Place Where Thinking is Valued, Visible, and Actively Promoted

“Cultures of thinking – places where a group’s collective as well as individual thinking is valued, visible, and actively promoted as part of the regular, day-to-day experience of all group members.” p. 219

“Without the benefit of others, our thinking would be severely curtailed. Our individual thinking benefits from being challenged, from the need to articulate ideas clearly and concisely to others, from the presentation of alternative perspectives and insights through others’ presentation of logic, the raising of questions, and so on. Furthermore, what we are able to achieve as a group by way of problem solving, decision making, and understanding is usually far greater than what can be achieved by the individual alone.” p. 220

“As creativity expert Sir Ken Robinson (2010) says, ‘Most great learning happens in groups. Collaboration is the stuff of growth. If we atomize people and separate them and judge them separately we form a kind of disjunction between them and their natural learning environment.’” p. 220

“Thinking must be valued, visible, and actively promoted.” p. 220

Vygotsky’s (1978) idea – “children grow into the intellectual life around them” (p.88) If we want to promote a culture of thinking we must surround students with thinking, not as a one-off activity that we engage in on special occasions but in the day-in, day-out, ordinariness of the classroom.” p. 220

“When teacher lament the fact that their students are not thinking, it is often precisely because they have been taught not to think or told, often implicitly through the kinds of work they have been assigned that they cannot think.” p. 221

“When thinking becomes part of the daily practice of the classroom and teachers show an interest in and respect for students’ thinking, then students who had not previously been seen as academically strong begin to shine.” p. 221

“Learning to truly listen to another, to try to understand their point of view, however different to your own, is an essential part of creating an effective culture of thinking. If we can do that then we can truly think and learn collaboratively. I have a favorite instructional throughline that I use each year, ‘Why is thinking together more powerful than thinking alone?’ It may take a few months, but eventually a student each year will eventually quote that back to me.” p. 229

“If we don’t have structures in place to support our values, then we won’t get the best out of students. Too often schools concentrate on fixing behaviors rather than putting in place strategies that might prevent them from occurring in the first place.” p. 231

“In order for schools to be places of thinking for children, they must also be places of thinking for adults: something Ron Ritchhart talks a lot about. The goal has been to support people leading constructive dialogue in schools by providing them opportunities to engage with key issues current in education, share what is happening in different schools for constructive feedback, and read, think, and talk about ideas current in wider society.” p. 234

“Thinking requires time. Without the time to engage properly with an object or idea, an opportunity for thinking can feel hollow. It is only through extended inquiry that conjectures can be made, perspectives examined, theories weighed, and new understandings developed.” p. 237

“Group culture is a dynamic enterprise continually under construction. Unexamined, these cultures may seem mercurial in nature. However, analysis reveals that there are a set of clearly identifiable forces at work; expectations, opportunities, time, modeling, language, environment, interactions, and, of course, routines. These forces provide the leverage points for creating a culture of thinking and can help us to understand the context in which the use of thinking routines and other efforts to make thinking visible can flourish.” p. 240

“In creating a culture of thinking, setting expectations for learning and the types of thinking required is key. Expectations include the goals and purpose of the group, outlining the nature of the learning enterprise itself while signaling the kinds of thinking that will be necessary to that enterprise.” p. 240

“Expectations provide the focus and direction for thinking, but opportunities are a mechanism by which those expectations will be realized.” p. 241

“The importance of selecting good content is a cornerstone of creating rich opportunities for thinking. Rich content draws the learner in in some way. At the same time, it provokes or challenges the learner to move to a new place.” p. 241

“A rich thinking opportunity must also provide for meaningful interaction with that content.” p. 241

“Embedded within the creation of opportunities is the provision of time for thinking. Good thinking requires time. Without time, teachers and leaders cannot expect insights, connections, and understandings to develop.” p. 241

“Coverage is the ultimate delusion of those who place the act of teaching (or presenting) above the act of learning.” p. 242

“To achieve insight and understanding, one must have the time to think about and with ideas.” p. 242

“Instructional modeling has its place in instruction, but it isn’t really a shaper of culture. The kind of modeling that creates culture is more subtle, ubiquitous, and embedded. It is the modeling of who the teacher is as a thinker and learner. This kind of modeling can’t be ‘put on’ for students’ benefit; it must be real. Students know if a teacher is passionate about a topic, interested in ideas, engaged as a learner, thoughtful and deliberative, and so on.” p. 242

“What are the needs of learners that the environment can facilitate? There is the need to communicate, discuss, share, debate, and engage with other learners.” p. 244

“Learners also benefit from the records and documentation of the group’s learning journey. This practice allows both individuals and the group to see where they have been, recognize growth, make connections, and raise new questions.” p. 244

“Understanding benefits from listening to and taking in others’ ideas and viewpoints, evaluating them, making connections to one’s own thoughts, and then presenting one’s thinking to others, knowing that it too will be challenged and must be backed by evidence and reasons. Within such a social context, robust understanding and innovation often flourish (Johnson, 2010).” p. 245

“One of the benefits of routines is that once they become established, individuals and groups can use them with minimal directions or support.” p. 246

Chapter 8 Notes from the Field

“Just as a vase holds and supports a bouquet of flowers, the routine supports the exploration of the content.” p. 261

“Through the regular use of routines to explore meaningful content with students, teachers convey messages about the nature of thinking and learning. Chief among these are the notion that:

1. Learning is a consequence of thinking
2. Learning is as much a collective endeavor as it is an individual process.

3. Learning is provisional, incremental, and evolving in nature.
4. Learning involves continual questioning aimed at uncovering the complexity of ideas.
5. Learning is an active process that entails getting personally involved.” p. 261

“Teachers come to see that assessing students’ understanding requires that their thinking be made visible.” p. 262

“I used to begin my planning by thinking about what routines I could use in my unit. Now I think about what kinds of thinking I want my students to do and choose a routine to scaffold and support those kinds of thinking.” p. 265

“A defining moment we have observed among teachers is when they change their questions from ‘What thinking routine should I use?’ to ‘What kind of thinking would make sense to invite her in this moment?’ and begin making instructional choices and decisions accordingly. Likewise, these teachers make a shift from announcing the use of a thinking routine to highlighting the kinds of thinking that will be important in the situation and then the thinking routine that will be used as the vehicle for supporting the thinking.” p. 269

“When a **worksheet** is being filled out, invariably the amount of interaction is reduced and the focus becomes doing the work rather than learning. The worksheet killed the thinking. A worksheet is something to be filled in for the teacher. It then becomes the goal rather than the thinking.” p. 271