

Learning Design for Broader, Deeper Competencies

Report 11 of the MyWays Student Success Series



October 2017

Grace Belfiore and Dave Lash
for Next Generation Learning Challenges

The MyWays™ Student Success Series

All reports in the series are available for download at myways.nextgenlearning.org/report.

Visual Summary
Introduction and Overview

Part A: Adolescence in an Age of Accelerations

Summarizes specific real-world realities and conditions confronting today's young people.

- Report 1: Opportunity, Work, and the Wayfinding Decade**
- Report 2: 5 Roadblocks to Bootstrapping a Career**
- Report 3: 5 Decisions in Navigating the Work/Learn Landscape**
- Report 4: 5 Essentials in Building Social Capital**
- Report 5: Preparing Apprentice-Adults for Life after High School**

Part B: Broader, Deeper Competencies for Student Success

Provides a composite definition of student success in learning, work, and life.

- Report 6: Welcome to the MyWays Student Success Framework**
- Report 7: Habits of Success — for Learning, Work, and Well-being**
- Report 8: Creative Know How — for a Novel, Complex World**
- Report 9: Content Knowledge — for the Life Students Will Lead**
- Report 10: Wayfinding Abilities — for Destinations Unknown**

Part C: Redesigning the Learning Experience for the MyWays Competencies

Brings the broader and deeper competencies of the MyWays Student Success Framework into educational practice.

-  **Report 11: Learning Design for Broader, Deeper Competencies**
- Report 12: Assessment Design for Broader, Deeper Competencies**

About this report

Report 11, *Learning Design for Broader, Deeper Competencies*, shares an overview of learner-centered paradigms, focuses on the growing importance of authenticity, and introduces three MyWays learning design constructs that support the broader, deeper competencies — *Whole Learning*, *Wider Learning Ecosystem*, and *Levers for Capability and Agency*. The report also offers resources to support initial moves toward implementation.

Report 11 is the first of two reports in Part C of the *MyWays Student Success Series*. **Part C, “Redesigning the Learning Experience for the MyWays Competencies,”** explores how to bring the broader and deeper competencies of the MyWays Student Success Framework into educational practice, focusing on key constructs for learning design and assessment design.

The *MyWays Student Success Series* examines the through-line of four essential questions for next generation learning and provides research and practice-based support to help school designers and educators to answer these questions. The series consists of 12 reports organized into three parts, plus a Visual Summary and Introduction and Overview.

The **primary researchers and authors** of the *MyWays Student Success Series* are Dave Lash, Principal at Dave Lash & Company, and Grace Belfiore, D.Phil., Principal Consultant at Belfiore Education Consulting.

MyWays is a project of Next Generation Learning Challenges, an initiative of the non-profit EDUCAUSE. MyWays is supported through a grant from the William and Flora Hewlett Foundation with additional support from the Bill & Melinda Gates Foundation, the Barr Foundation, and the Oak Foundation.



nextgenlearning.org



© 2017 EDUCAUSE. This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Cover photo courtesy of [Project Lead The Way](https://www.projectleadtheway.org/).

REPORT 11

Learning Design for Broader, Deeper Competencies

“Young people need experiences that actualize new cognitive and social skills, that foster curiosity, persistence, and competence; that nurture the will to learn and the desire and the courage to invest in future learning experiences. They need learning settings that are demanding yet also responsive to developmental needs and differences... and they need experiences that provide opportunities to contribute — to a discipline, cause, community, or traditional or emergent cultural endeavor.”

—Robert Halpern¹

Introduction

The previous Parts A and B of this series have explored “Adolescence in an Age of Accelerations” and, as a result, the need for “Broader, Deeper Competencies for Student Success.” Those 10 reports address the *Why* and the *What* of student success. Part C, comprised of this report and Report 12, addresses the final two questions in the MyWays Through-line: the interrelated *How* of learning design and *How* of assessment design. In this context, Halpern’s quote is particularly useful if we convert it to a series of questions:

How do we create experiences that actualize new cognitive, social, and navigational skills?
How do we foster curiosity, persistence, and competence?
How do we nurture the will to learn and the desire and courage to invest in future learning?

The MyWays Through-line

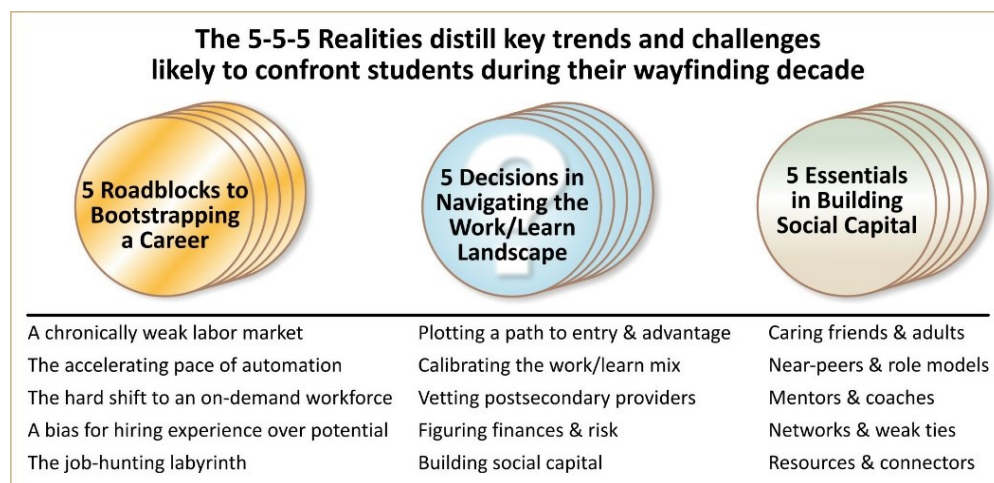
1	WHY the urgency to change? What are the real-world conditions that our students will need to address?
2	WHAT does success look like for students in a world of accelerating change? What competencies promote a broader, deeper definition of success?
3	HOW can our learning experience design help students develop the broader, deeper competencies?
4	HOW do we gauge student progress in developing these competencies? How can we measure our school’s success beyond proficiency in math and ELA to embrace whole child development?

The challenges the nation faces in preparing our students for a rapidly changing and unpredictable future are not to be underestimated; however, it is also true that our understanding of learning science and adolescent development has never been keener. There is growing consensus for learning experiences that address the whole person, that engage deeper understanding, that prepare learners to ask new questions and seek new types of answers, and that ultimately support learners in their self-development and their ability to continue learning throughout their lives.

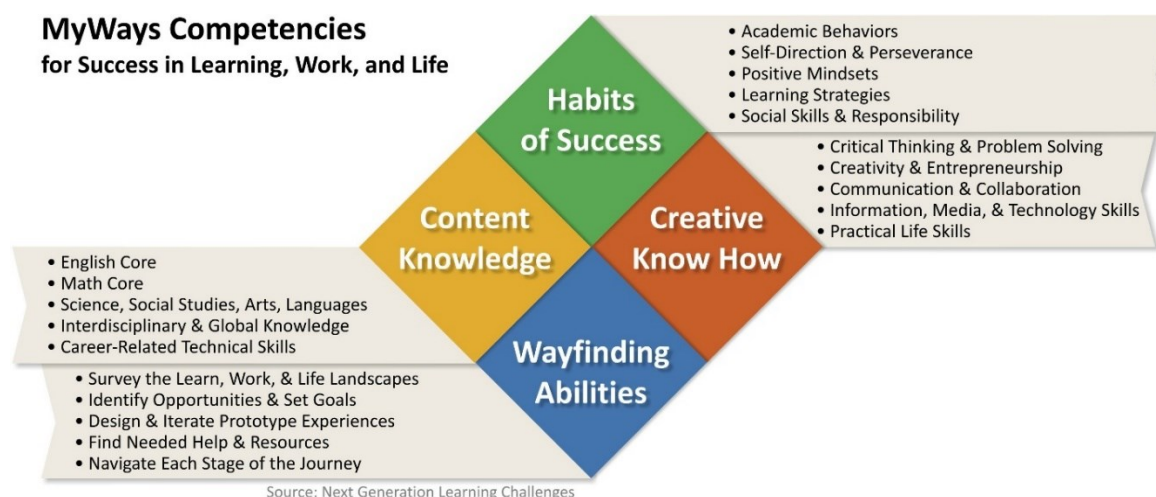
The MyWays Project has also suggested two key parameters relating to learning design for broader, deeper competencies. ***First, competencies build over time, so starting early (in developmentally appropriate ways) is vital.*** The life-defining decisions that young people make in the wayfinding years immediately following high school require different forms of experience, agency, and responsibility than traditional learning design engenders. ***Second, there is no substitute for real world immersion and authentic learning.*** Most of the competencies in the MyWays Student Success Framework require an

integration of higher thinking skills and real-world abilities. Both these themes are explored in this report, which focuses on three key learning design constructs that we believe are essential to next generation learning: Whole Learning, Wider Learning Ecosystem, and Levers for Capability and Agency.

These themes are not isolated “good ideas” — they emerge directly from the MyWays research on the accelerating world in which we live, and the kinds of competencies our students need to thrive in it. As a quick review for readers who have previously read reports from Parts A and B, and for those other readers who are starting here in Part C, we provide two overview graphics to summarize our analysis. The first features the 5-5-5 Realities, 15 key factors and trends that students will confront. For more on the implications of these challenges, and on the nature of adolescent development in today’s world, see the Part A reports.



The second graphic summarizes the synthesis the MyWays team created of 20 student competencies needed for success in learning, work, and life, clustered into four domains in ways that elevate the agency-driven, agile, and navigational aspects of the broader, deeper competencies. For more on the nature of the domains and key principles for addressing them, see the Part B reports.



In Part C, we deal with learning design and assessment design. While we devote one report to exploring each of these two aspects of learning experiences, they can and should not be separated in practice. In particular, MyWays’ adherence to the idea of assessment *as and for* learning means that Report 12 is in many ways an extension of the current report, and we urge you to look at the two together.

In this report, we provide an overview of the design of learning for broader, deeper competencies by presenting the following:

- A brief snapshot of efforts to reimagine learning through learner-centered paradigms
- An exploration of the growing importance of authenticity, as illustrated through the MyWays Field of Learning (our “ballfield” graphic)
- An introduction to three MyWays learning design constructs that support authenticity:
 1. *Whole Learning* through junior versions
 2. Impacts and opportunities of the *Wider Learning Ecosystem*
 3. *Levers for Capability and Agency* to help students develop the MyWays competencies
- A quick resource dive for broader, deeper learning that includes
 - Starter resources
 - Three simple MyWays evaluation tools and a case study for how to use them
 - A guide to sources for competency-related deeper implementation tools, such as rubrics and learning progressions

The learner-centered design landscape

If our analysis of the age of accelerations, the uncertain work/learn landscape, and the essentials in building social capital has taught us anything, it is that we must reimagine students’ experience of “school.” Similarly, if the richer and more agile competencies that learners need to succeed personally and help society thrive drive us to a particular focus for learning, it is toward a learner-centered paradigm.

A range of genuinely inspiring work in this vein is being supported nationwide by education innovators both longstanding ([Montessori](#) organizations, the [Coalition for Essential Schools](#), the [New York Performance Assessment Consortium](#)) and new ([Next Generation Learning Challenges \[NGLC\]](#), the [Hewlett Deeper Learning Network](#), [Digital Promise](#), [EdLeader21](#), [NewSchools Venture Fund](#), [High Tech High](#), and [XQ SuperSchools](#)). However, transforming learning to the extent required for the 5-5-5 Realities — and in ways that will reach *all* learners — is a substantial undertaking. Education Reimagined, an initiative of the national nonprofit [Convergence](#), brought together a group of “28 influential and diverse education leaders, thinkers, and innovators for a... dialogue process” to tackle this crucial challenge, “uniting those with divergent views to reimagine learning.” The resulting document, [A transformational vision for education in the US](#), is “designed to catalyze a new national conversation about education transformation and to become a rallying point for a network of pioneers.... It puts forward a vision for the future of learning but does not provide a one-size-fits-all answer for how to get there,” and is intended to spark “conversations about how this vision could manifest itself in the diversity of communities across the country.”²

This new vision for learning is highly aligned with MyWays’ focus on learner agency and with the four MyWays competency domains. The latter is hardly surprising, as Education Reimagined endorsed the knowledge, skills, and dispositions domains of the Council of Chief State School Officers’ competency framework (one of the many consulted in developing MyWays; see the competency framework alignment

chart on page 6 of the *Introduction and Overview of the MyWays Student Success Series*). To ensure development in these domains for all learners, Education Reimagined envisions learning experiences characterized by the five interrelated elements illustrated in the following graphic.



Education Reimagined is careful to assert that these five elements “are not meant to serve as a blueprint for a rigid model to be implemented everywhere. Instead, they serve as a ‘North Star’ to guide innovation. They do not create a single roadmap that can be followed the same way in every learning community. Realizing new designs will be an iterative process....”³

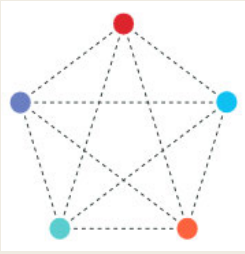
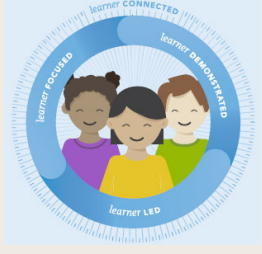
We strongly support this inclination to value diverse, user-driven approaches rather than to provide prescriptions, and to account for local context and different perspectives; indeed, as we discuss in the *Introduction and Overview* and in Report 6, we follow the same approach in the MyWays Project.

Education Reimagined’s distillation curates and integrates current efforts in learner-centered learning design, providing a useful context for situating our deeper dive into learning design for broader, deeper competencies. The organization’s work combines two of the more prominent streams of next generation learning (competency-based education and personalized learning) with three design characteristics that we view as essential to addressing the challenges our learners face now and in the future (opportunities for learner agency, a rich social embeddedness, and the authenticity that comes from opening walls to the Wider Learning Ecosystem).

While the number of future-ready learning frameworks increases annually,⁴ some live at a more granular level of learning design; we examine a few of those in the section, below, on Whole Learning. The broader frameworks share many elements, while also contributing valuable additional perspectives based on their origin and the purposes they serve.

A comparison of NGLC’s Student Perspective of Next Generation Learning with Education Reimagined’s Learner-centered Design Framework and LEAP Innovation’s Personalized Learning Framework illustrates the scope of attributes being addressed, as well as a broad convergence around some elements (see the box below).

Comparison of Learner-Centric Design Frameworks

Ed Reimagined <u>Learner-centered</u>	Next Generation Learning Challenges <u>Next gen learning – the student perspective</u>	LEAP Innovations <u>Personalized learning</u>
		
Competency-based	- Organized around my own progress against goals I understand - Constantly informed by different ways of demonstrating and measuring my progress - Challenging but achievable, with opportunities to become expert in an area of interest (R)*	Learner demonstrated
Personalized, relevant, and contextualized	- Personalized to the ways I learn best - Flexible so that I can try different ways to learn - Interactive and engaging so that I participate in the learning - Relevant to the life I'd like to lead (R) - Agile and supportive when I need extra help - Challenging but achievable, with opportunities to become expert in an area of interest (R)	Learner focused
Learner agency	NGLC does not highlight agency as a single competency, as it maintains that students need to develop agency and capability across all competencies. As the following illustrate, agency is embedded in all NGLC competencies: - Organized around my own progress against goals I understand (R) - Challenging but achievable, with opportunities to become expert in an area of interest (R) - Relevant to the life I'd like to lead (R)	Learner led
Socially embedded	Collaborative with teachers and peers, unlimited by proximity (R)	Learner connected
Open walled	- Collaborative with teachers and peers, unlimited by proximity (R) - Relevant to the life I'd like to lead (R) - Challenging but achievable, with opportunities to become expert in an area of interest (R)	
(No equity equivalent)	Available to me as much as it is to every other student (R)	(No equity equivalent)

* R = repeated in two or more cells

Clearly, the three frameworks have substantial overlap and synergy. Some differences in content and formulation can be attributed to the context in which they were created, the organizations involved, and the purpose for which they were created. Education Reimagined’s broad, **systems-level learning framework** arose, as described above, from a consensus exercise among stakeholders from many different types of organizations — from teacher unions to right-of-center funders — and was intended to spark further discussion and collaborative action. Several years before the other two frameworks were created, NGLC intentionally set out to provide a list of attributes of next generation learning **from the student perspective**, drawing on learner experiences within its network of early innovator grantees. One of NGLC’s Regional Funds for Breakthrough Schools partners is LEAP Innovations, a Chicago-based connector and learning innovation incubator that also leads the [Learning Assembly](#), a national community of practice. While the LEAP framework’s top level (included in the table) broadly matches the others, LEAP has also built out **next-level indicators, strategies, and examples** to help translate what its personalized learning attributes look like in practice. For additional information on these and other implementation tools, see the resources box at the end of this report.

Activating learning for broader, deeper competencies

As our brief scan of learner-centric design frameworks illustrates, there is already some excellent thinking and innovative practice in the design of learning experiences to help students prepare for their (and our) future. Building upon this work, rather than attempting to replicate it across the board, this report focuses on three specific elements of learning design that we identified as essential given our research on the 5-5-5 Realities (Part A, Reports 2–4), on preparing adolescents to become apprentice-adults (Part A, Report 5) and on the resulting competencies students need to address these challenges (Part B). When we pared it all down, we found that the essential design elements all relate in some way to the idea of *authenticity*. We therefore start with this concept, using a visual thinking tool we call the *MyWays Field of Learning*.

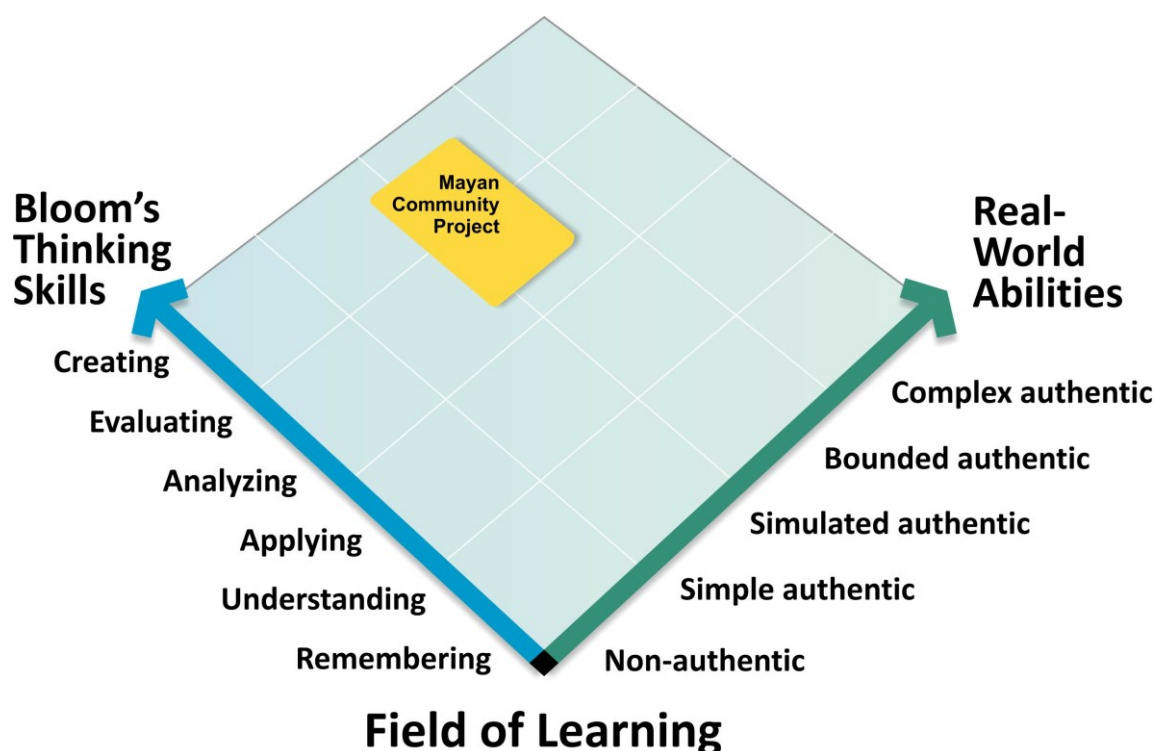
Extending the Field of Learning

Recall Halpern’s description at the start of this report notes that students need experiences that “actualize new cognitive and social skills; that foster curiosity, persistence, and competence... and that provide opportunities to contribute — to a discipline, cause, community, or traditional or emergent cultural endeavor.” In particular, a substantial majority of the competencies identified in the MyWays Student Success Framework require **an integrated combination of thinking skills and real-world abilities**. Not surprisingly, especially in the domains of Creative Know How and Wayfinding Abilities, “textbook learning” is insufficient. Further, brain science has confirmed that students also learn Content Knowledge more durably and transferably through authentic learning activities, while Habits of Success can be developed only in complex, socially situated experiences that require or enable learner agency.

The MyWays Field of Learning (below) is a useful visual device for envisioning learning activities in terms of the thinking skills and real-life abilities they engender. For example, High Tech High’s Mayan Community Project, discussed later in this report and analyzed at depth in a MyWays Toolkit worked case study, is at the high end of the thinking skills axis and spans both simulated and bounded authentic

settings. Later, we will compare this project to learning experiences on a variety of locations on the field. But first, let's focus on the field itself.

The left axis progression will be familiar to many, but it is worth spending a little time to understand the progression in authenticity represented by the values on the right.



Bloom's Thinking Skills

The left-field axis uses Bloom's taxonomy* to key a familiar progression of thinking skills. While the taxonomy is not technically a hierarchy, in our usage here, the skills are cumulative as one moves out the axis: Applying, for example, includes Remembering and Understanding, while Creating includes all five of the "earlier" skills.

*Webb's Depth of Knowledge would also work here, but we judged Bloom's to be more broadly known and thus more suited to this purpose.

Real-World Abilities

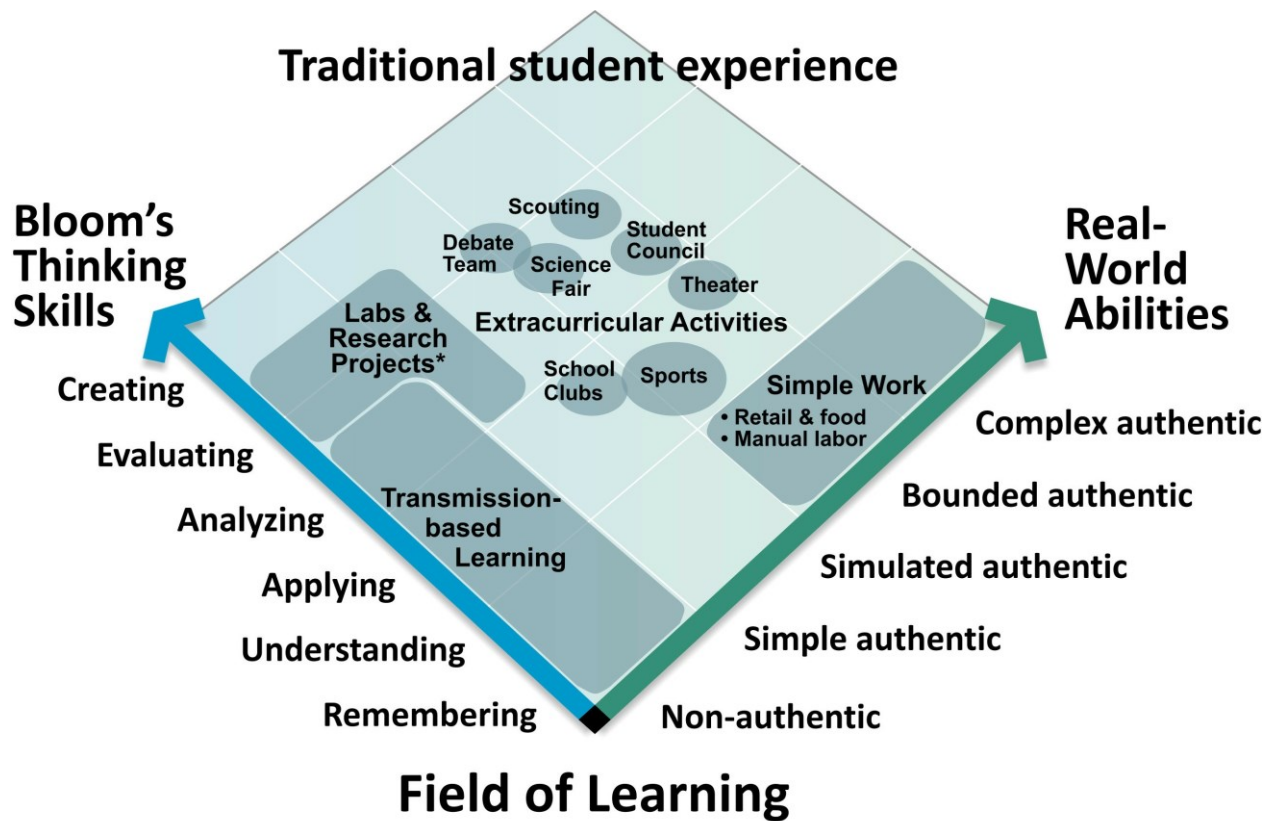
The right-field axis indicates growing competence as the authenticity of the setting increases.

For example, a particular middle schooler might be competent in Self-Direction or Communication & Collaboration within "simulated authentic" settings (such as those within school), but not in "complex authentic" settings in the adult world.

This progression also allows specific learning activities to be plotted by degree of authenticity.

Now that you are familiar with the field itself, let's look at two versions that illustrate the shift in learning required by the move to a new, broader definition of student success. The first graphic

that follows maps the common student experience in traditionally-designed public schools, while the second shows a broader, deeper experience that occupies much more of the field.

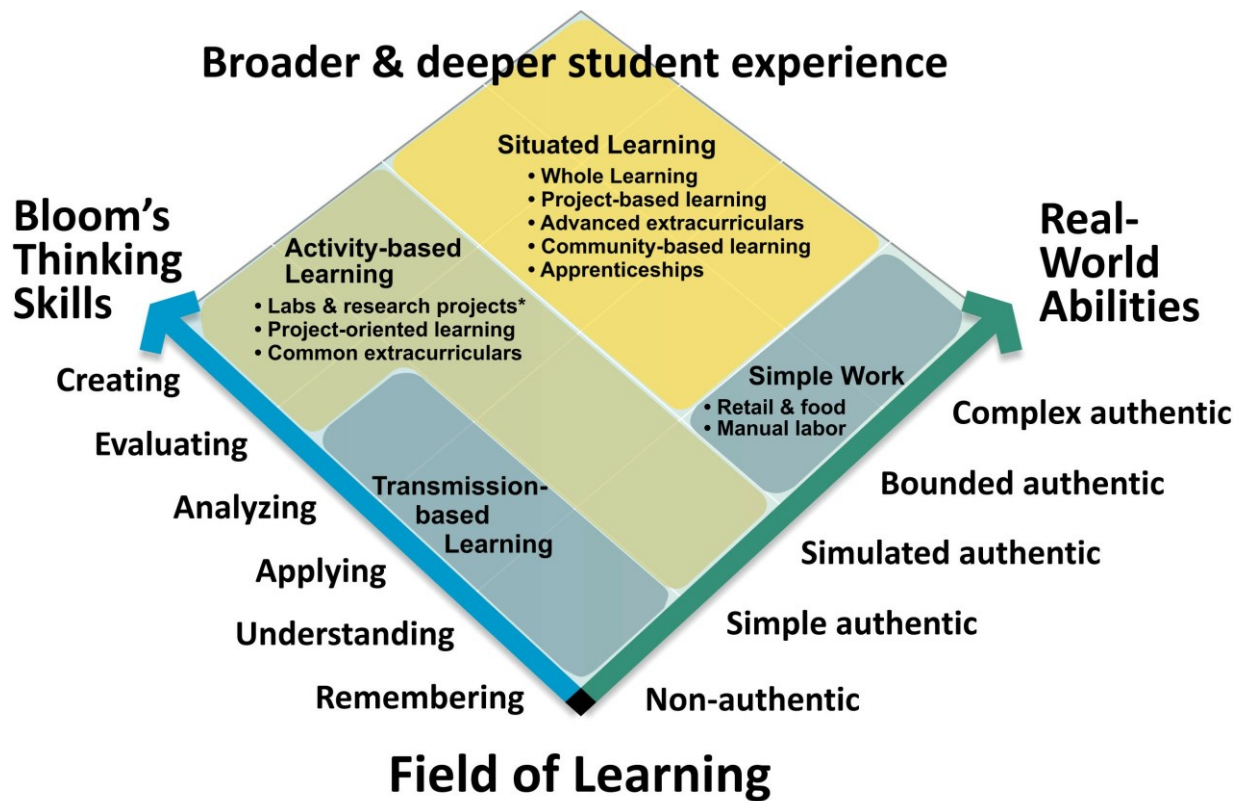


* Including activities associated with Advanced Placement and International Baccalaureate, or inspired by Common Core.

This first mapping represents the traditional student experience: lots of transmission-based instruction in the classroom, some labs and research projects focused on higher-order thinking skills, a smattering of more authentic extracurricular activities, and, in some cases, simple minimum-wage afterschool or weekend work with little training.

Notice how closely most traditional learning, being transmission-based, hugs the left axis. This approach has dominated school learning, despite the fact that learning science and human development research show that experience-based, student-driven learning in more complex, authentic situations is more durable and transferable.

To develop broader, deeper competencies attuned to today's real-world challenges, we need to rebalance the learning field by incorporating more learning that leaves the left-field line and expands into the rest of the field, as illustrated in the next iteration, below.



* Including activities associated with Advanced Placement and International Baccalaureate, or inspired by Common Core.

This second field shows an extended and rebalanced mix of learning experiences, with significant additions further out the right axis in the situated learning zone. In this zone, higher-order thinking skills are engaged within real-world settings that are either bounded (within a controlled setting or one with some constant variables) or complex (unbounded).

Situated learning⁵ broadly describes many learning approaches that are embedded in activity, context, and culture. In these approaches, knowledge is presented in situations that typically use that knowledge, and social interaction and collaboration are essential, with novices learning from those with more expertise until they eventually become experts themselves. These ingredients are all essential for developing the MyWays Student Success Framework competencies.

Knowledge is presented in situations that typically use that knowledge, and social interaction and collaboration are essential, with novices learning from those with more expertise.

We further analyze some of the situated learning models below.

Our [set of Field of Learning slides](#) is also freely available, and includes an empty grid on which you can plot your own set of learning experiences.

Three constructs to help activate the broader, deeper Field of Learning

To understand more deeply the fundamental changes required to embrace expanded competencies, we offer three key constructs that can be particularly helpful to those committed to including greater authenticity in their students' day-to-day learning experiences. Because these concepts are interrelated, we start with a brief preview of all three, as fully describing any one of them requires reference to the others.

1. Whole Learning, through junior versions (seven principles)

As we analyzed how design for learning can most effectively support students' attainment of the richer, deeper definition of success, we were consistently brought back to one foundational concept: the creation of learning experiences that “honor the whole.” That is, learning experiences that, by their holistic nature, are authentic enough to engage learner curiosity, purposeful enough to contribute to the development of learner identity, and complex enough to require the kind of adaptable skills that are needed in a global and accelerating world. To explore this key design parameter, we draw on David Perkins' principles for learning by wholes, and his guidance on how to do this through “junior versions.”⁶

2. Wider Learning Ecosystem (five experience zones and a support infrastructure)

One of the most striking implications of our exploration of the broader, deeper competencies required for a complex future is the realization that it is difficult, if not impossible, to help learners develop them without going outside the school walls. In the same way, holistic, authentic learning often occurs more readily in the varied and complex experiences available in the “real world.” The benefits of this kind of learning are extensive, as it enables students to practice and develop competencies in the world in which they will live and work — making connections to mentors and brokers, and developing identity, agency, and social capital. We explore wider ecosystem experiences across five zones: school-based extracurriculars, college-based learning, career-related learning, community-mediated learning, and every day formal and informal learning.

3. Levers for Capability and Agency (eight levers for learning)

As we describe in the *Introduction and Overview of the MyWays Student Success Series*, the MyWays idea of *competency* encompasses both capability and agency. We highlight here a set of eight “learning levers” that brain science and learning research indicate are effective in developing these two aspects across all competencies. The levers to enhance and develop capability (defined as “knowledge and the understanding to use it in real-life situations”) include: durable retrieval, desirable difficulties, cognitive apprenticeship, and authentic success. The levers to enhance and develop agency (defined as “a deep and durable self, acting to shape one's development and environment”) include: scaffolded self-management, supported self-reflection, adult-world immersion, and maker empowerment. We introduce these eight levers in the last section of this report.



LEARNING DESIGN CONSTRUCT 1: Whole Learning, through junior versions

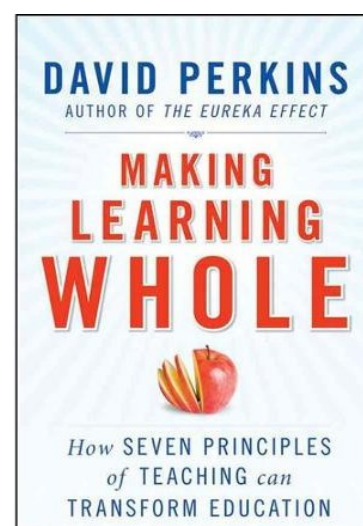
“I’m struck by how visions of meaningful education seem to speak to three basic agendas: enlightenment, empowerment, and responsibility.”

—David Perkins⁷

While developing MyWays, we were heartened to encounter a growing array of learning approaches and models highly relevant to the kind of teaching, learning, and assessing essential to meaningfully address the broader and deeper life competencies that MyWays promotes. Among the many approaches that provided insights on and pathways to the development of the MyWays richer competencies are Robert Halpern’s youth development-informed principles; Big Picture Learning’s [Leaving to Learn](#); High Tech High’s personalization and adult-world connections; the Buck Institute’s project-based learning (PBL) [Gold Standard](#) and [High Quality PBL initiative](#); Linked Learning’s [Behaviors of Learning and Teaching](#); Digital Promise’s [challenge-based learning](#) and [maker learning](#); and NGLC’s [school-design grantees](#).

All of these approaches, at their best, are grounded in more authentic, holistic, and purpose-driven learning that engages whole person competencies. However, each also has its own aims, context, approach, and strengths. In addition, each of these learning approaches is practiced in ways that foster the broader, deeper learning competencies — and also, in other places, is implemented in ways that are highly unlikely to prepare learners for the 5-5-5 Realities. They may fail, for instance, to enable student agency and the development of Habits of Success, to engage creativity and other Creative Know How competencies, or to develop the adaptability and Wayfinding Abilities that today’s learners need to thrive in a disorderly world.

We had begun highlighting design elements that we felt were essential for the kind of experiential learning needed to develop the broader and deeper outcomes that MyWays embodies when we were delighted to discover David Perkins’ principles for [Making Learning Whole](#). His identified outcomes — “enlightenment, empowerment, and responsibility”⁸ certainly fit with the self-reflective, agency-oriented, and socially situated competencies explored in Part B. His principles also address the most vital implications of advances in learning and developmental science. Perkins, of Harvard’s [Project Zero](#), draws on his previous work in teaching for understanding and other foundations familiar to next generation educators; this connects his work to our other key learning constructs as well: Wider Learning Ecosystem and Levers for Capability and Agency.



Perkins' principles not only matched our emerging design parameters, they also reflected and extended many of the elements of the next generation approaches mentioned above. Thus, in our view, his principles extend MyWays' "rosetta stone" functionality from competency definition to learning design (see a crosswalk of selected models below).

Whole Learning...

Perhaps most crucially, Perkins' central message of **learning by wholes** is perfectly aligned with the fact that most of the competencies needed to address the 5-5-5 Realities require the integrated combination of thinking skills and real-world abilities displayed in the authentic, applied, and relevant experiential (or "situated") learning zone of the MyWays Field of Learning — *that is, Whole Learning experiences that involve real working, playing, and co-creating*. And we embrace his insistence that, while educators need to design learning with detailed forethought and care (more on this below), students' experience of learning should be largely holistic and purposeful, and full of organic self-discovery.

Perkins points out that learning most meaningful real-world activities, complex career tasks, demanding arts performances, or challenging sports requires more than, on one hand, learning "about" the activity or, on the other hand, developing skills in isolated elements of the activity. Instead, deep and engaged learning requires *understanding how the whole thing works, actively engaging in the different elements of the activity, experiencing what works and what doesn't, and completing and delivering an authentic product to a real audience*. As Perkins asserts, "the natural engaged purposefulness of such occasions is what learning by wholes aims to capture."⁹

... through "junior versions"

Because "Whole Learning" (such as doing scientific research, making a commercial, running a community organization, playing tennis, composing a song, or making and keeping friends) is complex, Perkins introduces the concept of a **junior version** — that is, *an accessible experience that is scaffolded in developmentally appropriate ways, while still keeping the essence of "the whole," with all the purpose, motivation, and complexity that that entails*. Think of the relationship between a science fair project and a real project at your local biotech company; between a high school play or community stage



"[P]articipants in a musical theater production have the opportunity to experience the process from soup to nuts: the initial line reading, the blocking, the development of the set design, the back-and-forth between directors and actors, and, ultimately, the integration of these elements in a final performance."

"The 'periphery' of schools was often more vital than the core... extracurriculars like dance, theater, sports, newspapers, and more that were full of student passion and apprenticeship-style learning... [T]hese spaces are not only more fun and engaging, but they also offered better platforms for learning."

—Jal Mehta¹⁰

production and a professional show; between shooting a student film and a TV documentary; or between T-ball or Little League and the game of baseball.



“Put it this way: When I was playing [Little League] I wasn’t playing full-scale, four bases, nine innings.

But I was playing a perfectly suitable junior version of the game. A junior version was just right for my size and stamina and the number of kids in the neighborhood.

But when I was studying those shards of math and history, I wasn’t playing a junior version of anything.

It was kind of like batting practice without knowing the whole game. Why would anyone want to do that?”

—David Perkins¹¹

Junior versions, we believe, play a vital role in the design of learning to address the breadth and depth of the MyWays competencies, in ways that also promote agency and capability. After presenting the Whole Learning principles in more detail, we will return to junior versions to consider which design characteristics make them work as meaningful and motivating versions of Whole Learning.

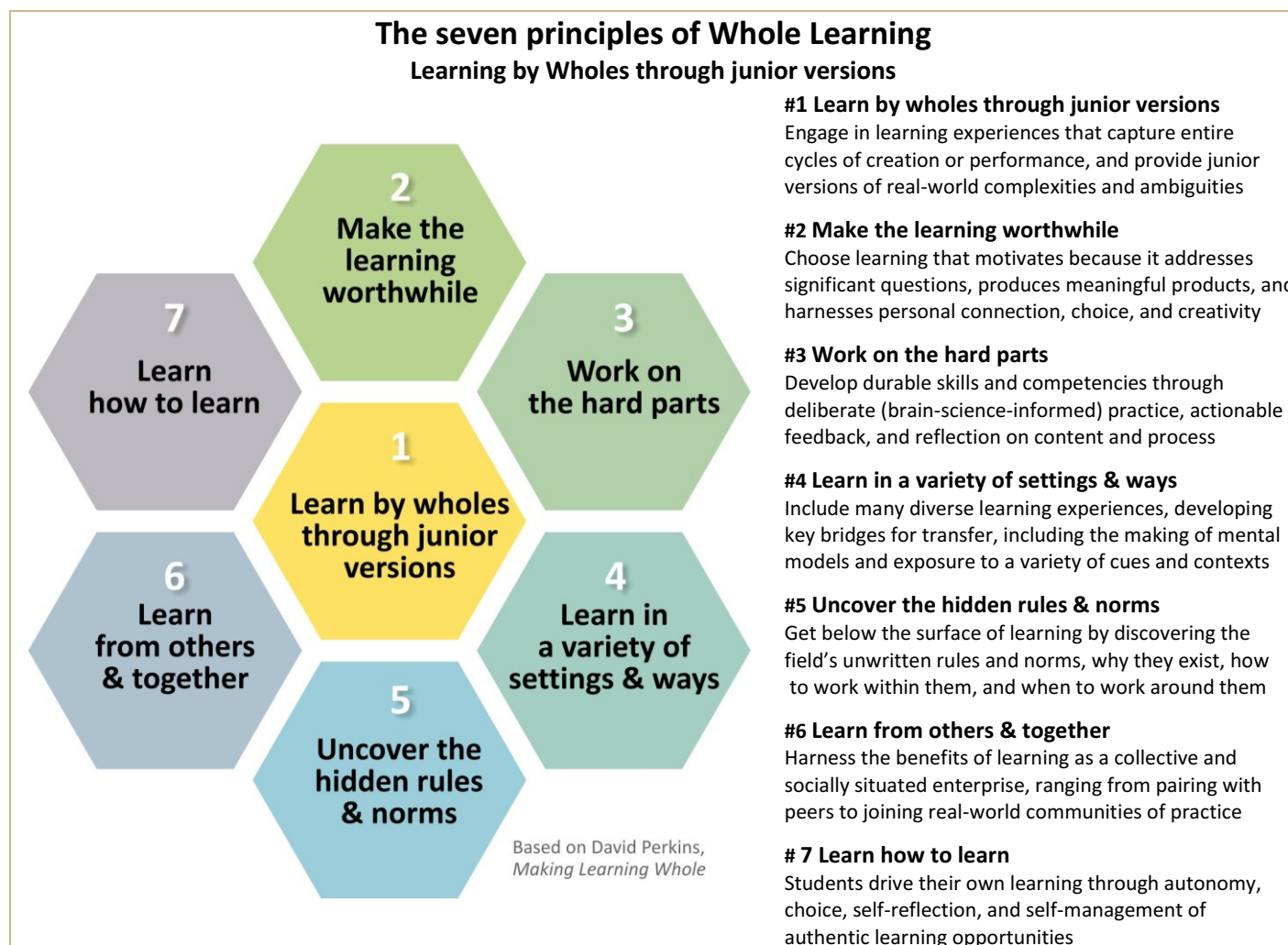
For now, it is worth noting that these characteristics can be woven not only into extracurriculars, but also into service-based and work-based learning — as well as into high-quality classroom-based PBL, which perhaps presents the greatest challenge. In school settings, and particularly in core curriculum areas, the environment for Whole Learning, use of the Wider Learning Ecosystem, and development of Levers for Capability and Agency (all of which are critical to designing powerful learning that addresses the richer competency goal-line) is often challenged by existing culture, structures, and accountabilities. That is why, of all the vital aspects required to redesign learning for the world in which our students

will live, MyWays highlights these three concepts, starting with the central concept of learning by wholes.

The seven principles of Whole Learning: honoring the whole while embracing the (hard) parts

As the center of the honeycomb below shows, Perkins’ first principle — *learn by wholes through junior versions* — encapsulates the full model. The other six principles provide essential parameters and criteria that, together with the first principle, create ***a conceptual tool for understanding and evaluating learning design that enables and promotes the broader, deeper life competencies represented in the MyWays Student Success Framework.***

Note: we have adapted the wording of Perkins’ principles slightly, moving away from his strong “game” metaphor — Perkins uses the term “whole game learning” — to a set of wordings that more directly express educational principles and practices; our goal in doing this was to avoid the need for additional translation from principles to implementation. Perkins himself suggests this as an option in his book.¹²



In this first introduction to all the principles, we urge you to pause to read through each of the brief descriptions to the right. While described in seven elements, you will see that these principles also cluster into familiar learning design goals: principles 1 and 2 (Learn by wholes and Make the learning worthwhile) focus on the big picture of a meaningful, motivating learning experience. Principles 3, 4, and 5 (Work on the hard parts, Learn in a variety of settings & ways, and Uncover the hidden rules & norms) incorporate important specific practices that help address transfer to the real world. (The Levers for Capability and Agency, covered in the last section of this report, provide additional guidance here.) Principle 6 (Learn from others & together) and Principle 7 (Learn how to learn) bring in the collaborative and self-directed learning approaches that have become essential in a world of accelerations.

While our purpose in this section of the report is to explore the Whole Learning principles in a conceptual way, it is worth establishing that there are thousands of students learning this way right now in schools across the country. The Whole Learning construct aligns well with the learning approaches of many next generation learning approaches, as illustrated in the following matrix, which maps the principles against a selection of well-known models. Following the matrix, we review the Whole Learning principles and then offer an example of how they work in practice using the PBL model.

How Whole Learning Aligns with Selected Next Generation Learning Models

It is worth reiterating that Whole Learning is a set of principles rather than a model. We use the principles partly because they are so useful in highlighting the elements within most of the leading next generation learning models that are particularly relevant to student agency, capability, and approaches that engage the full range of broader, deeper student competencies. The following matrix illustrates these points.

Next Gen Learning Models Mapped to Whole Learning

7 Principles of Whole Learning	NGLC Student Perspective	Deeper Learning Six Powerful Strategies	Big Picture Learning Imperatives Student Expectations	Linked Learning Behaviors of Learning & Teaching	Buck Institute Gold Standard PBL (2014 update)
Whole Learning, through junior versions Engage in learning experiences that capture entire cycles of creation or performance, and provide junior versions of real-world complexities and ambiguities	Interactive & engaging	Contextualize: Tie subjects together and keep it real	Authenticity	High quality integrated projects that are: [see rest of column]	Authenticity public product
Make the learning worthwhile Choose learning that motivates because it addresses significant questions, produces meaningful products, and harnesses personal connection, choice, and creativity	Personalized to way I learn best; Flexible so I can try different ways; Relevant to life I'd like to lead	Inspire: Customize learning to motivate each student	Relevance; Choice; Play	Relevant	Challenging problem/question; Student voice & choice;
Work on the hard parts Develop durable skills and competencies through deliberate (brain-science-informed) practice, actionable feedback, and reflection on content and process	Organized own progress v. goals; Agile when need help; Different ways to demonstrate & measure progress		Practice; Timing (opportunity to sequence learning); Time (customized learning schedule)	Outcome focused (and Rigorous)	Reflection Critique & revision
Learn in a variety of settings & ways Include many diverse learning experiences, developing key bridges for transfer, including the making of mental models and exposure to a variety of cues and contexts		Reach: Network beyond school walls	Application	Integrated	
Uncover the hidden rules & norms Get below the surface of learning by discovering the field's unwritten rules and norms, why they exist, how to work within them, and when to work around them	Challenging but achievable; opportunity to become expert in area of interest		Challenge	Rigorous (and Outcome focused)	Sustained inquiry
Learn from others & together Harness the benefits of learning as a collective and socially situated enterprise, ranging from pairing with peers to joining real-world communities of practice	Collaborative with teachers & peers, unlimited by proximity	Connect: Create a community of learners	Relationships	Collaborative	
Learn how to learn Students drive their own learning through autonomy, choice, self-reflection, and self-management of authentic learning opportunities		Empower: Activate students to lead their own learning		Student directed	

Developed by Next Generation Learning Challenges based on *Making Learning Whole* by David Perkins.

NOTE: This matrix is based on lists of elements, strategies, or principles published by the different models, rather than on an exhaustive analysis of each model's comprehensive set of processes and practices.¹³

Going deeper with the seven Whole Learning principles

We have summarized Perkins' seven principles below, emphasizing the elements most vital to supporting richer, future-ready competencies and the agency and adaptability required to survive and thrive in the accelerating world we described in Part A.

We encourage you to take the time to read and consider these descriptions; the principles encompass approaches and practices that are invaluable in understanding how to foster richer, deeper, more future-ready learning. Indeed, we highly recommend that you refer to Perkins' book, *Making Learning Whole*,

which provides chapters on each principle that offer rich background, research, and practice examples. Later in this report we illustrate how these principles relate to practice-oriented approaches such as PBL, and provide an example Whole Learning in practice, using simple evaluation tools that you can use to analyze the learning experiences in your own school or network against these principles.

#1 Learn by Wholes through junior versions

The challenge we all face

Formal learning delivered through traditional practices rarely gives us the chance to see, from the start, the big picture of what we are learning (instead of just an element of it), or to play an active role in the learning (rather than simply learning about something). These issues contribute to students' lack of motivation, ability to retain and build on what they have learned, and opportunity to develop the agency that is central to developing the broader and deeper life competencies.

Key elements

Provide authentic learning experiences that capture entire cycles of creation, production, or performance, and often mirror the complexities and ambiguities of real-world work and life (“the whole”), but are designed and scaled in developmentally appropriate ways or simulated with appropriate scaffolding (“junior versions”). Provide the big picture, even if you need to start with elements, and engage the learner in student-directed work that requires engagement in problem solving, explanation, argument, evidence, strategy, and skill or craft.

Examples

Some examples here include high-quality project-based, problem-based, inquiry-based, and studio-based learning, along with rich simulations, role-playing scenarios, and case-based learning. Other examples are student-led co-curriculars and extracurriculars, such as theater productions and science and history fairs; structured workplace learning such as apprenticeships; “youth-led” boy and girl scout troops; and service learning. The junior version should be holistic, as well as incorporate Perkins’ six other principles.

Later, we offer links to a case study that illustrates how one well-documented High Tech High PBL project — the Mayan Community Project — incorporates Whole Learning principles, as well as links to a set of simple tools to help you plan or evaluate your own junior versions to support broader, deeper competencies.

#2 Make the learning worthwhile

The challenge: Lack of engagement

Students become less and less engaged over their school years because much of the content they are learning does not relate to their lives or their future. The learning process also fails to meet students where they are or to increase their understanding enough to motivate them intrinsically.

Key elements

Make learning worthwhile by focusing on content that motivates students because it yields insights into many circumstances (through the use of big/essential questions, and understandings of wide scope) and because it applies to learners’ lives. This is exactly the kind of content that also enhances transfer (see #4). With regard to the learning process, create engaging beginnings and well-paced formative and performance assessments; cultivate confident, proactive mindsets; foster energy through individual choice and authentic, meaningful products, performances, or outcomes; enable personalization in junior versions so that students can alter the challenge level to best induce flow; and harness creativity through storytelling and inquiry.

#3 Work on the hard parts

The challenge: Developing core skills

Students either avoid the parts of learning that are hard for them, or they spend time working on them in ways that brain science has shown us are less than effective for retaining knowledge and developing skills. And feedback fails to “stick” unless it is integrated back into the whole.

Key elements

Embrace areas of difficulty by pursuing regular episodes of deliberate, brain-based practice (spacing out study periods, and interleaving or alternating study sessions on different topics) for durable retrieval that feeds back into the whole (for more on this, see the “Levers for Capability” section below); use ongoing, actionable, formative peer- and self-assessment; provide informative and timely feedback so students can improve and reapply their skills; and create learning projects, games, or simulations that incorporate opportunities to practice known areas of difficulty at developmentally appropriate levels within holistic, active learning experiences.

#4 Learn in a variety of settings & ways

The challenge: Applying skills and knowledge across domains

The one thing we know about our students is that their future will differ from our reality today in ways we can’t foresee, and that it will encompass ongoing change. The issue of learning transfer is thus critical, but research confirms that learners often do not transfer learning from one context to another.

Key elements

Increase the likelihood of successful knowledge and skills transfer in novel circumstances by: focusing on learning aimed at big/essential questions and understandings of wide scope; using reflection and abstraction to promote mental model-making as a bridge for transfer; and including many diverse applications to increase the likelihood that learners will encounter cues and contexts similar to those they will find in the future. Increasing variety can also be as simple as partnering a student with a learner of a different age or background to discover different perspectives and approaches.

#5 Uncover the hidden rules & norms

The challenge: Making sense of it all

Learning in school, work, and society has significant aspects that are invisible to learners but essential in developing expertise and efficacy. This applies within the disciplines of Content Knowledge and the applied skill areas of Creative Know How, Habits of Success, and Wayfinding Abilities. So, why not just make the tacit aspects visible as strategies and teach them? Because research shows this alone doesn’t work.

Key elements

Deeper learning in any competency requires students to get below the surface of learning. To progress from novice toward experienced practitioner, learners need scaffolding to uncover strategies, understand causality and power, and pursue inquiry. Although it helps to make the rules or strategies explicit, real understanding of the hidden rules and norms can come only from participating actively, applying strategies, and personally managing this process. Basically, you have to participate, make missteps, and iterate. Offering access to “very junior versions” and mentoring/modeling by adults and peers, as well as paying attention to both process and product in learning design, are particularly relevant here.

#6 Learn from others & together

The challenge: Learning to collaborate

Much of traditional school learning is a solo exercise. Yet both learning research and the experience of real-world learning illustrates the benefits of learning from and with others. In particular, the development of student agency, as well as capability in all of the broader life competencies, requires opportunities to apply knowledge, skills, and self-management within a social context.

Key elements

“Learn from others & together” involves harnessing the benefits of learning as a collective enterprise by paying attention to participation structures. These structures range from discussion and dialogue, pair problem solving, and cross-age tutoring to learning systems designed around zones of proximal development with social scaffolding. The concept of situated or social learning suggests that, to be truly meaningful, learning requires an authentic context of social endeavor. In practice, all of this adds up to a true community of practice that includes students and adults across the Wider Learning Ecosystem, where students engage in *legitimate peripheral participation*, taking on simple but productive tasks that further the community’s goals while enabling the students to both become familiar with community principles and progress in competence.

#7 Learn how to learn

The challenge: Becoming a habitual learner

Students within traditional schooling are more passengers than drivers of their own learning. Even within more active learning models, students may not meaningfully direct their own learning or be supported to reflect on it. To thrive in a world of change, however, learning to learn — which is critical both as a Habit of Success and as an element of agency across all the competency domains — is the most important learning our students can do.

Key elements

Learning design must put students in the driver’s seat and give them significant autonomy and choice. In addition to specific learning skills such as study practices, time management, and problem solving (reflected in the MyWays capability levers), learners need to develop the skills of self-reflection and self-management (reflected in the first two MyWays agency levers). Attention to these skills should be explicit, as well as infused within core learning with appropriate “just-in-time” direct transmission or other stand-alone instruction as needed. Like any other type of learning, this works best within a Whole Learning approach, starting with scaffolded junior versions of holistic experiences that involve a gradual release of responsibility.

How to design a junior version

To reap the benefits of learning by wholes, educators need to be able to structure learning experiences in a way that is both practically feasible and supports their students in developmentally appropriate ways. This is where the “junior” part of “junior versions” comes in. Perkins provides guidance on designing these learning experiences, suggesting that the exercise is part process and part art. We have interpreted and organized his suggestions into a single set of design parameters. As we mentioned earlier, creating a junior version is like inventing a Little League, lab environment, or Model UN for the full activity — transforming a real-life working, creating, or playing experience into a developmentally appropriate learning experience as follows:

- **Capture the basic structural features** of the full-scale activity.
- **Throw out less important aspects of the activity**, while leaving its spirit and shape intact.
- **Swap in simulations, replicas, or scaled-down versions** for elements of the activity that are not developmentally appropriate or practically possible.
- **Set and maintain a reasonable level of challenge** for the group and for individual learners; this essential step *requires educators to know*
 - *the learners*, including their prior knowledge, interests, and learning agility; and
 - *the stages of developmental readiness*, or “what happens to knowledge, understanding, and self-awareness as children advance from kindergarten through high school and beyond.”
- **Include all seven Whole Learning principles**, balancing an experience of the meaningful whole with attention to the hard parts, hidden norms, and group work, as well as with reflection on how elements of the learning are happening.
- **Prototype and tune the learning experience to align with student capabilities.** “The first time around,” says Perkins, “involves at least as much learning for you as it does for the learners, because you are almost always wrong in some ways... Only over two or three cycles of working with real learners in real situations can we expect to home in on truly well-calibrated junior versions.”¹⁴

An example of Whole Learning: PBL that honors the whole

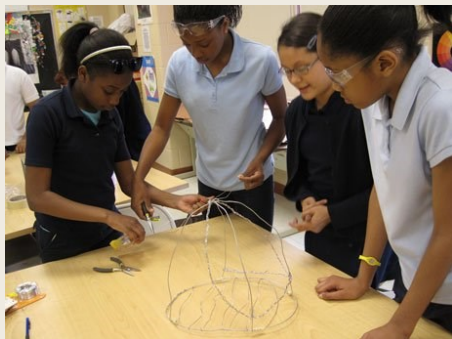
As mentioned above, most educators are familiar with examples of junior versions. These examples include well-designed project-based, inquiry-based, and studio-based learning; rich simulations; student-led co-curriculars, such as theater productions, history fairs, and DECA; service learning; youth development projects; scouting or Odyssey of the Mind programs; and apprenticeships. All such experiences can be valuable junior versions — if they capture the essence of a “whole” *and* embed the remaining six Whole Learning principles.

Like most educational endeavors, Whole Learning is a complex enterprise. The devil here is in the details of implementation, and in building the culture and capacity to “hold the whole.” Take PBL, one of the fastest growing and perhaps most broadly developed implementations of Whole Learning practice. These days, shout-outs to PBL come from all corners of the education world; examples include the focus on High Tech High in Ted Dintersmith’s documentary [Most Likely to Succeed](#), Getting Smart’s [It’s a Project-Based World](#) campaign, The Buck Institute’s [High Quality PBL initiative](#), and New Hampshire’s pairing of PBL professional development with its longstanding focus on performance assessment.

At the same time, organizations such as the Buck Institute, EL Education, Big Picture Schools, New Tech Network, and others have been practicing PBL for decades, developing its culture and iterating its processes and tools. The combination of a mature community of practice, the challenges of popularity, and calls to scale make PBL an instructive case study in the paradox of Whole Learning and how intentional design is needed to address it.

A Whole Learning Movement: High-Quality PBL

“It’s easy to do project-based learning,” notes Tom Vander Ark, “it’s just hard to do it well.”¹⁵ What longtime PBL practitioners know is that authentic learning experiences contain a paradox. Learning science, deeper learning practice, and our analysis of the needs of an accelerating world all indicate that the most effective learning experiences are holistic and authentic, giving learners organic opportunities for ownership and agency. Yet behind the scenes the experience also often needs enough — but not too much — intentional design and developmental scaffolding to ensure that learners can discover, practice, develop, and interact in ways that will enable them to move toward their richer learning goals.



Perkins’ Whole Learning principles provide direct guidance on addressing this paradox. Principle 1 can be thought of as the prime directive: *learn by wholes*. Whole, authentic, purposeful learning creates a culture aimed at engaging learner identity, deepening understanding, and preparing learners to work in and contribute to the real world. At the same time, principles two through seven are also essential, driving the hard, behind-the-scenes work of enabling students to develop durable skills, self-reflect, collaborate, and learn to drive their own learning. Those ready to embrace these principles

need to come to grips with the underlying learning architectures and the carefully developed processes and tools — the planning templates, learning progressions, rubrics, and protocols for critiques and performances — that make these learning experiences work effectively. The MyWays Levers for Capability and Agency (outlined later in this report) highlight the learner, educator, and interpersonal practice elements of this considered practice.

Concerns about PBL, like other types of Whole Learning, often focus on one side of this paradox or the other. Some educators are concerned that competencies, progressions, and rubrics, instead of being used appropriately within a Whole Learning framework, will instead be used to organize the learning or assessment in ways that “atomize” skills and learning. For how it could all go wrong, see the “remedial creativity” box in Report 6, and the whole food versus “nutritionist” processed food analogy in [this blog](#) by Michael Petrilli. “Right now,” PBL expert Thom Markham asserts, “not all PBL is equal, and we’re not to the point in which all PBL supports the whole child. Too often, the goal is to cover standards under the guise of ‘student-centered’ instruction.”¹⁶

Other educators are worried that PBL may be authentic, and even holistic, but not rigorous. PBL’s growing popularity has raised a concern that hands-on activities or interesting experiences are being tacked on to other types of instruction and labeled *PBL*, without resulting in deep and engaging learning. How to balance the two sides of the paradox?

First, honor the “whole”

Markham, in this [MindShift blog](#), provides excellent advice on how to design the kind of PBL likely to “break students out of the box of conventional thinking” through five big ideas, all of which live within the holistic, authentic experience:

- **See PBL as a mindshift, not a method.** “When done well, [PBL] takes students deep. It can awaken as well as teach, help students dig into their psyche a bit, and actually mature young people... PBL gives us a path forward out of the industrial past and into a world that requires a deep set of attitudes and skills necessary for navigation.”
- **Put challenge first.** “Obviously standards need to be addressed.” However, “start with a challenge that excites students. Daydream. Muse. Envision students’ faces at the end of the project. Once the vision and

intention is fixed — and a teacher feels the challenge — that’s the time to return to linear mode: What standards will students learn, and how?”

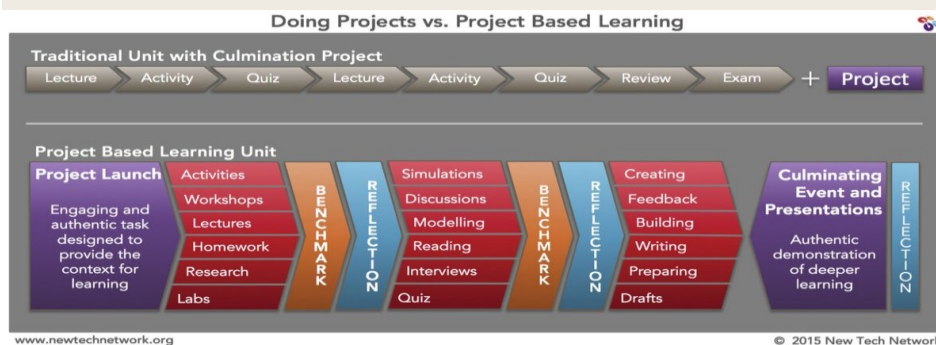
- **Get a lot better at Driving Questions.** It is not “well understood that the question or the problem is the high leverage key to deeper learning.”
- **Turn skills and content into one conversation.** “PBL offers a learning experience that seamlessly blends core concepts, key facts, reflective thinking, careful judgment, and skillful application of knowledge — all of which coalesce into a solution to a meaningful problem.”
- **Coach for openness.** “A skillful PBL teacher does much more than teach, and PBL offers amazing opportunities to go for the real gold in education: helping young people become open, curious adults.”

Markham’s advice is highly aligned with both the MyWays competencies and the seven Whole Learning principles in that it also consciously targets “innovation, design thinking, self-directed learning, and, most critically, the kind of wisdom required in today’s world rather than the 1950s.” (See the related reference to “knowledge on the way to wisdom” in Report 9’s box on high-leverage concepts.)

Second, ensure effectiveness and quality

As the demand for and interest in PBL increases, a growing resource set of processes, tools, exemplars, and case studies are being shared and published with the intention to improve practice on PBL’s “hard parts.” Following are three types of resource:

- **The Buck Institute** updated its 8 Essential Elements of PBL to a new Gold Standard PBL model in 2015 and contributed to [Getting Smart’s It’s a Project Based World campaign](#) in 2016; it has now launched the [High Quality Project Based Learning \(HQPBL\) initiative](#). Iterative and collaborative, HQPBL is creating a High Quality PBL Framework focused on processes, products, principles, and purposes, and guided by a 27-member steering committee and 90-member advisory committee.¹⁷ The [Spring 2017 draft](#) is currently available for use and comment.
- **Next Generation Learning Challenges** has connected the dots between the MyWays Student Success Framework, Whole Learning, and PBL, and curated some of the relevant resources in two Whole Learning/PBL blogs: “[Hard to Do Well: PBL and Authentic Learning Design](#),” and “[Embracing the Hard Parts: 8 Video Resources for Authentic Learning Design](#).” (We put the focus on video resources because we feel that Whole Learning PBL is one of those things you just need to see in action!)
- **Newtech Network**, a leading design partner focusing on student-centered PBL, offers [a graphic](#) that captures the difference between doing projects as “dessert events” (top line) and a PBL learning

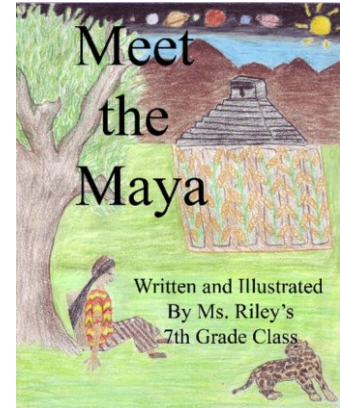


experience that starts with a complex challenge and includes iteration, reflection, and authentic demonstration of learning. As the graphic illustrates, Whole Learning PBL is an engaging experience of discovery based on an intentionally designed process. It’s “both/and.”

- **Other avenues** for schools looking to join communities of practice with well-regarded offerings in project design, significant teacher development, and a culture of student empowerment include [Project Lead The Way](#) and [Virtual Enterprises](#). The key with any implementation of PBL is for school designers, educators and, indeed, learners to invest in constructing their own authentic learning experiences that incorporate the Whole Learning principles, but these programs offer valuable and highly aligned resources and supports for this work.

What Whole Learning PBL looks like in action: a sample project and tools for your use

We provide further resources to help you understand Whole Learning in action and to assist you in evaluating your own projects and approaches through the analysis of **a sample Whole Learning PBL project: the Mayan Community Project**, from a High Tech High middle school using some simple MyWays matrix tools based on the concepts and constructs in this report. For further description of these resources see the MyWays Tools and Mayan Worked Case Study resource box at the end of this report.



The seven Whole Learning principles work together with the Wider Learning Ecosystem and the Levers for Capability and Agency. While, as mentioned previously, the Levers provide additional support to the Whole Learning principles relating to how learners acquire, retain, and use knowledge and skills, harnessing a broader range of complex, rapidly-changing, and diverse experiences that exist outside the classroom walls is vital to developing the kind of competencies our students need. We turn next, on the following page, to explore this Wider Learning Ecosystem, survey the various experience zones within it, and look at some of the key issues involved in harnessing its potential for Whole Learning.



LEARNING DESIGN CONSTRUCT 2: The Wider Learning Ecosystem

“Clearly, we face an urgent need to open up the learning landscape in America.... To do so, we need to create a richer fabric of learning opportunities for a diverse population of youth. The ‘we’ in this reform extends beyond traditional academic resources. A much broader segment of society needs to collaborate to find the domains and means to engage our young people in meaningful learning. Only then can we provide growth experiences that focus our young people’s passion and energy.”

—Robert Halpern, *It Takes a Whole Society*¹⁸

One of the most striking implications of our exploration of the broader, deeper competencies required for a complex future is the realization that it is difficult, if not impossible, to help learners develop them without going outside the school walls. As definitions of readiness and success expand from good grades, high test scores, and a high school diploma to the kinds of agency and capability required for the age of accelerations, our students need new competencies: Content Knowledge that will enable learners — just as it does real-world practitioners — to solve problems, weigh options, and make decisions; Creative Know How, optimized for transfer in rapidly changing situations; Habits of Success that can be developed robustly in a variety of learning and work contexts; and Wayfinding Abilities that require “lines of sight” to careers and the adult world. As Halpern notes, “It makes little sense to take large numbers of inexperienced individuals who are the same age and relative maturity, place them in an isolated setting, and ask them to use that particular setting to grow, mature, gain knowledge, and experience.”¹⁹ But this is exactly what traditional schooling does.

A range of established learning opportunities for students already exists outside the formal school walls and day, including afterschool activities, library programs, and internships. While some of these offerings are excellent, the vast majority of students lack access to many of them. Students who do have access to such opportunities are likely to find what 2Revolutions calls “a labyrinth of siloed program sectors”²⁰ with offerings that vary in quality, have little connection to academic work, and pay little attention to helping learners build social capital. To address the MyWays broader, deeper student competencies, schools need to better integrate the higher quality offerings from the established out-of-school sectors, offer students an even wider range of learning opportunities, and embed all of this into *all* students’ personalized learning paths. As Big Picture Learning says, ***“All students need to leave school — frequently, regularly, and of course,***

“All students need to leave school — frequently, regularly, and of course, temporarily... To accomplish this, schools must take down the walls that separate the learning that students do, and could do, in school from the learning they do, and could do, outside.”

Elliott Washor and Charles Mojkowski

temporarily... To accomplish this, schools must take down the walls that separate the learning that students do, and could do, in school from the learning they do, and could do, outside. The learning in both settings and contexts must be seamlessly integrated.” **Big Picture** calls it “leaving to learn.”²¹ As Michele Cahill describes it, this means, in essence, that “*we [need] to redefine ‘school’ as a porous organization.*”²²

We think of *the Wider Learning Ecosystem as the broad expanse of opportunities beyond classroom learning that can enrich collective and individual learning as well as student agency — an ecosystem that is ever expanding and changing, with a spectrum from formal to informal prospects, accessed through a wide range of settings, media, and players.* Our MyWays team is so convinced of the critical importance of engaging with this Wider Learning Ecosystem in a systemic and networked way that we are creating a separate resource on this topic, funded by the Barr Foundation; the forthcoming resource will be available on the [MyWays website](#).

In this report, we provide a preview of what we’re finding, including a look at the benefits of wider ecosystem experiences in addressing the 5-5-5 Realities, the MyWays competencies, and Whole Learning. We also offer a model that organizes the ecosystem into five zones and a support infrastructure; describe a set of three engagement models for how schools, networks, and districts can incorporate the overwhelming benefits of “the real world” in their learning model; and provide a glimpse into a few design considerations for incorporating these benefits.

Exploring the Wider Learning Ecosystem

“At the heart of an ecosystem for learning is an ability to draw upon the assets of an entire city or community to support students as they grapple with the two primary tasks of adolescence: building competencies and forming their identities.”

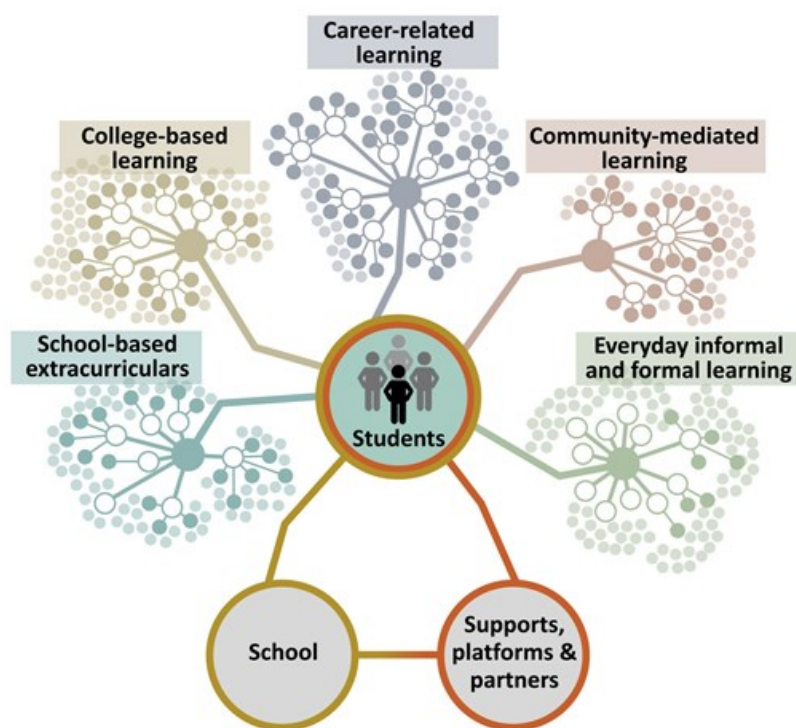
—Michele Cahill, *Smart Cities*²³

Opportunities for learning are everywhere around us, presenting themselves all the time. While there is much joyful life learning to be pursued in this way, our work on the 5-5-5 Realities, adolescent development, and Whole Learning suggests that our students also need more intentionally organized and supported real-world learning experiences to help them prepare to navigate in an accelerating world. With the student at the center, the full spectrum of learning opportunities outside of classroom learning become what MyWays, with its focus on a broader, deeper set of competencies, calls the *Wider Learning Ecosystem, or WLE*.

In exploring the various ways that individual students can engage with learning, we found it possible to group most of the experiences relevant to K-12 learners that relate to learning, development, identity building, and social capital into *five experience zones*:

The Wider Learning Ecosystem

Five experience zones for expanding K-12 student learning and social capital



School-based extracurriculars. As many of us know, activities that are commonly regarded as being on the “periphery of schools” can offer more authentic, vital learning than core classes. Theater productions, science fair work mentored by local scientists, or business start-up clubs may be school-based but many access or emulate the real world.

College-based learning. While focused on academic or vocational knowledge, programs such as dual enrollment or early college let high school learners broaden their horizons into vastly expanded subject areas, as well as offering opportunities to practice and develop greater independence and self-direction.

Career-related learning. There’s no better preparation for the “whitewater learning” that students will need to do in their adult work lives than to get exposure now, in supported ways, alongside adults. This type of learning includes early career awareness and exploration, internships, apprenticeships, and paid work.

Community-mediated learning. Activities such as youth development programs and the offerings available through collective learning networks, which are offered by community organizations ranging from museums to maker spaces, give learners excellent opportunities to develop identity, agency, and social capital.

Everyday informal and formal learning. This zone captures informal learning with friends and family, online learning, participation in online communities of practice, and myriad other paths.

Navigating any of these zones requires a *support infrastructure* that enables young learners to access, engage with, and get the most out of the learning, growing, and networking they do outside the school walls. These supports echo the three parts of the MyWays Developmental Framework for Social Capital depicted in Report 4 as a tree, extending from root social supports that “sustain human well-being and growth,” through the trunk of adult developmental relationships that “foster self-exploration, growth, and engagement in the larger world” to the branches of connections and networks that provide the “resources needed to accomplish one’s goals.” In the Wider Learning Ecosystem, the *webs of support* and roles of *institutional agents* discussed in Report 4 are, as in the work/learn landscape, necessary for all young learners and absolutely vital for those who might start with fewer resources to begin with.

For more on the five zones, see the boxes at the end of this WLE learning section. But first, we explore why embracing WLE experiences is worthwhile. We also examine how educators can approach this opportunity to give their learners experiences that help them learn in ways particularly suited to a world that demands that they navigate complexity, exercise empathy, and practice other broader, deeper competencies.

The benefits of engaging with the Wider Learning Ecosystem

Engaging with the real world outside the school walls offers extensive benefits for learners, for educators, for schools, and for communities. The potential is still being explored, but some of the benefits already identified by those involved in wider ecosystem learning include the following:

- **Provides the opportunity and conditions for “whitewater learning”**

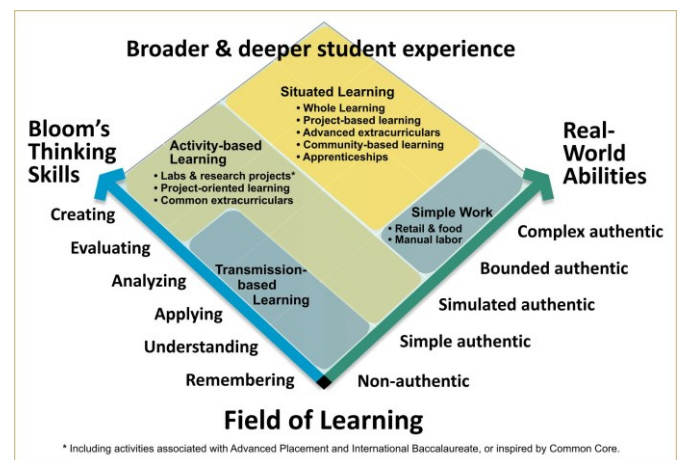
A core benefit of this type of learning is that it offers students an authentic acceleration lane for dealing with our complex, uncertain world and its plethora of challenges and opportunities. This benefit is captured nicely by Douglas Thomas and John Seely Brown’s concept of “whitewater learning.” They define whitewater learning as

“the ability to acquire useful knowledge and skills while at the same time practicing them in an environment that is constantly evolving and presenting new challenges.... *Our learning environments need to match the speed and degree of change happening in the world around us.* Rather than systematically accumulating static ‘stocks’ of knowledge, students now need to learn how *to actively participate in ‘flows’ of knowledge by engaging with others in the construction of new knowledge.* This kind of knowledge is often put to use at the same time it is learned. It is most effectively acquired through *solving problems with others in an environment that offers an abundance of challenges and unlimited opportunities.*”²⁴

Employers have been acknowledging this for some time; when asked for the most important factors in hiring a recent college graduate, their top choices relate not to academic performance but to more contextual, real-world experiences — including internships, jobs, volunteering, and extracurriculars.²⁵

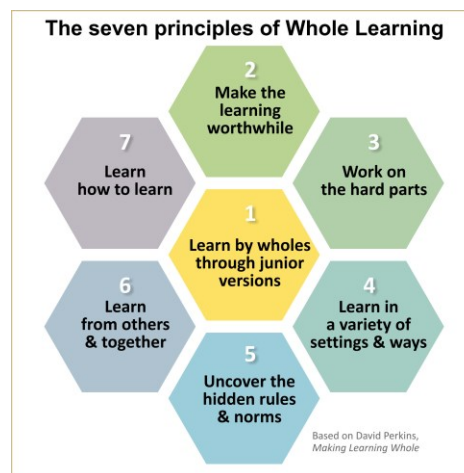
- **Enhances deep learning through increased authenticity**

Earlier in this report, we explored the need to increase the authenticity of learning experiences at the same time as we increase the level of critical thinking required of our learners. Engagement with the WLE offers a vastly increased array of learning experiences moving out the right hand *real-world abilities* axis, including those in the “golden rectangle” of situated learning. As highlighted by Thomas and Seely Brown earlier, such real-world settings are vital today because “our learning environments need to match the speed and degree of change happening in the world around us.... This kind of knowledge is often put to use at the same time it is learned. It is most effectively acquired through solving problems with others in an environment that offers an abundance of challenges and unlimited opportunities.”²⁶ This is one of the most compelling reasons to embrace WLE.



- Increases opportunity to engage the seven principles of Whole Learning**

Also earlier in this report, we presented the concept of Whole Learning, which draws together the characteristics of learning that targets the broader, deeper competencies, while incorporating lessons from learning science and successful deeper learning models. The seven principles of Whole Learning, repeated to the right, illustrate just how important a Wider Learning Ecosystem is to the practice of Whole Learning. While some of these principles rely fully on wider ecosystem opportunities, each of them is enhanced by learners acting in a variety of real-world communities alongside adults in meaningful work.



- Provides fertile ground for developing all four MyWays success domains**

The variety of settings, challenges, and contexts available in the WLE provide rich opportunities for learners to work on all four MyWays competency domains. The exposure to authentic contexts and professional communities of practice enhance the application of Content Knowledge and opportunities to develop agile, transferable Creative Know How. The need for increased personal responsibility and social skills, the opportunities for personal choice, and the chance to test one's responses to new and changing environments open doors to developing Habits of Success that more teacher-driven, static learning environments struggle to provide.²⁷ The WLE offers perhaps the greatest additional opportunities for developing Wayfinding Abilities. Community and work-based learning in particular offer learners access to what Generation Schools Network calls "Visions of the Possible," and Educurious calls "Lines of Sight"²⁸ to career and adult life choices that schoolchildren from any background are less and less likely to be exposed to; such access is even more crucial for learners with deep but not wide or extensive networks. When out in the world, students can begin to try out acceleration lanes to their adult lives, finding out that more is expected of them, testing which learning strategies work when they are learning and doing at the same time, and asking themselves whether they are using all the assets they have.

- Offers connection to mentors and brokers, and other forms of social capital**

As noted at the start of Report 4, "Opportunities do not float like clouds. They are firmly attached to individuals. If you're looking for an opportunity, you're really looking for people." In that report, we show just how important the development of social capital is to the success of young people in the more uncertain, self-driven, flexible, and ever-changing society and economy they will need to navigate. In fact, we argue that social capital may be one of the key factors for success, as well as the limiting factor driving the opportunity gap for low-income students and students of color. Situating learning within real-world projects or work that involves adults, near-peers, community networks,

and professional communities of practice greatly increases the opportunities for youth to interact with mentors, coaches, brokers, and others who can act as connectors as these learners move out into the work/learn landscape in their wayfinding decade. As Report 4 points out, many internships and other WLE experiences fail to harness the potential for building social capital, but High Tech High, among a few other models, has long focused on this benefit (see the box at right).

Ben Daley, CEO of High Tech High, tells students to choose a good mentor over what might seem like the perfect experience: “While students should look for an internship in an area of interest, they should also ***carefully pick a mentor, a key piece of the experience.*** It’s not about narrowly predicting what they are going to spend the rest of their life doing. ***It’s much more about the relationship between mentor and student.***”²⁹

- **Develops youth identity and learner agency**

In Report 5, we discussed five developmental tasks of adolescence. Two of those — finding self, strengths, and direction, and acquiring capability and agency — are critically important to all students in developing success competencies; both tasks cry out for learning in the wider ecosystem, in which learners are called upon to develop their own resources and directions within highly challenging, and therefore stretching, situations, while also being surrounded by views of possible role models and (if they are fortunate) other supports that will enable them to safely prototype versions of themselves and work toward the self they want to be. As research cited in Report 4 suggests, the identity challenge for young people today is no longer about choosing fixed roles, but about ambiguity and continual choice. For this reason, “we need to take a long look at the conditions that prepare youth for a changing, uncertain future, including the experiences provided by the family, the peer group, the school, and the community as a whole”³¹ — precisely the developmental experiences in adult settings that occur across the WLE. At the same time, the development of *agency*, which MyWays defines as “a deep and durable self acting to shape one’s development and environment,” also varies by situation and is challenged by disorderly, unfamiliar circumstances. Experience in real and diverse situations is key to agency, and to help achieve growth, educators and youth advocates need to help students access and utilize a WLE that is unprecedented in its breadth and depth.

“Ultimately, the internship experience is a taste of the real world, a glimpse into various fields of interest and an enticement for what school can help students achieve. But the experience often develops personal growth, as well. I **think that internships are really, in essence, about an expansion of identity, of incorporating what you couldn’t have done before, and new relationships that you didn’t have before, into your sense of who you are.** And that’s something that’s a rare commodity in our classrooms, but it’s there in abundance in the internship experiences.”

—Rob Riordan, High Tech High³⁰

- **Improves student engagement**

Student engagement is improved through a variety of factors, including greater satisfaction gained through the creation of productive and authentic outcomes, and greater meaning and the development of identity through connections to learners’ personal and community lives. Indeed, most of the other benefits listed above also result, as a secondary benefit, in the kind of deep student engagement in learning that improves and extends learning outcomes.

- **Offers additional opportunity to address equity issues**

Low-income learners, students of color, English-language learners, and those with disabilities often live in worlds with less wide-ranging community and work connections and fewer opportunities to develop other forms of social capital, while at the same time offering their own assets and funds of knowledge. In turning attention to the Wider Learning Ecosystem, we acknowledge this set of challenges up front and have designed into WLE programs and infrastructure ways to develop and enhance *all* learners' abilities to build their own social capital offering. Since the 1990s, increasing income inequality and district funding cuts have only widened the extracurricular and enrichment participation gap between more- and less-advantaged families. While upper- and middle-class students have become more active in school clubs and sports teams over the past four decades, their working-class peers "have become increasingly disengaged and disconnected."³² This is particularly counterproductive, as we begin to realize the ways in which active/authentic experiences might in fact play to the strengths of these students, and just how greatly these WLE experiences may effect later outcomes.³⁴ We therefore need to ensure not only that all learners have access to potentially transformative experiences, but also that those who need it are given an enhanced support infrastructure. This infrastructure should support the development of critical consciousness to help learners access the WLE themselves. Efforts should also be aimed at structural change to make their ecosystem more equitable for other learners. MyWays, like UChicago's Foundations for Young Adult Success developmental framework, highlights the need "to strike a balance between helping youth thrive in the world as it is, and develop the skills and dispositions they need to challenge a profoundly unjust status quo."³⁵

"From an equity perspective, building an ecosystem that affords access to learning opportunities that extend and enrich academics is highly promising, as economically advantaged families are dramatically increasing their investments in student talent-building activities and experiences in the out-of-school time hours."³³

—Michele Cahill, Carnegie

Three ways schools engage with the Wider Learning Ecosystem

In much of our exploration of the Wider Learning Ecosystem, we worked to keep the learner front and center. We adopted an institutional lens, however, to examine how schools organize their interaction with the Wider Learning Ecosystem in order to bring a transformed learning experience to their students. Schools and networks/districts start in different places and also have different aims for how they incorporate the WLE. In our initial scan of current practice, we've tracked three different approaches to such engagement:

- **Integrated engagement:** Wider Learning Ecosystem experiences are fully embedded and integrated in the school's learning design.
- **Connected engagement:** schools connect directly at an institutional level with organizational partners to offer a particular set of WLE opportunities.
- **Facilitated engagement:** schools facilitate the engagement of individual learners with organizations or experiences of their choice within the Wider Learning Ecosystem.

Each of these approaches can be implemented along a spectrum of intensity. In addition, it is critical to note that *these approaches are not mutually exclusive; some schools use two or more in combination*. Schools looking for first steps, and those thinking deeply about longer-term strategies, should be able to find, somewhere in these conceptual options, inspiration for how they might increase their students' engagement with the wider world.

Integrated engagement

Some schools' learning designs have Wider Learning Ecosystem experiences baked into their DNA. In these cases, the wider ecosystem learning is almost always a rich "junior version," structured to involve authentic process and meaningful product as well as real-world exposure, and to loop reflection and learning back into each student's personal and academic learning plan. We will be exploring and analyzing these models further in our forthcoming WLE resource as they provide clues to vital design principles that can also be built into more circumscribed WLE experiences.

Perhaps the most succinct way to illustrate what makes these models different is to look at a well-known example: Big Picture Learning, the Rhode Island-based charter, which we cited at the start of this report for its practice of "leaving to learn." Big Picture's criteria for leaving to learn (see the box at right) illustrate what makes this embedded approach different from field trips, siloed service requirements, or individually organized, unconnected senior internship quarters:

integration, reflection, personalization, and the value assigned to the WLE experience. Learners' work inside and outside the school walls are connected and integrated in a way that genuinely changes both sides of the learning experience. Although it may not be surprising that these characteristics are visible in Big Picture Learning's criteria for WLE opportunities, they are also woven through every one of the organization's broader "[10 distinguishers](#)." Learning Through Interests and Internships (LTI) clearly reflects this approach, but it is also evident explicitly or implicitly in almost every other distinguisher (look for parent and family engagement, treating each student holistically, assessment through public display of learning, an interdependence between school and community, and so on). As Elliott Washor and Charles Mojkowski put it in *Leaving to Learn*, "*It's not just about getting students out early and often, but about what they do when they get out, and how they bring their learning and accomplishments back to school.*"³⁸ Examples of integrated, baked-in WLE exist throughout the five WLE zones, and seem particularly strong in career-

Big Picture Schools' criteria for leaving-to-learn opportunities:³⁶

- They are **open to all students in all grades**.
- They are **an integral part of students' learning trajectory**, merging in- and out-of-school learning.
- They **address important learning standards** (academic, workplace, and personal).
- They **complement and supplement the in-school experience**, providing productive learning experiences that students cannot get in school.
- They **address students' expectations**.
- They **contribute to productive learning**.
- They are **awarded academic and graduation credit**.

See also Ed Reimagined's Open-Walled learning characteristics, and sets of principles from the National Society for Experiential Learning and the Association of Experiential Learning.³⁷

related learning; see, for example, [Generation Schools Network](#) and [Da Vinci Schools](#) (both NGLC grantees) and [Linked Learning](#).

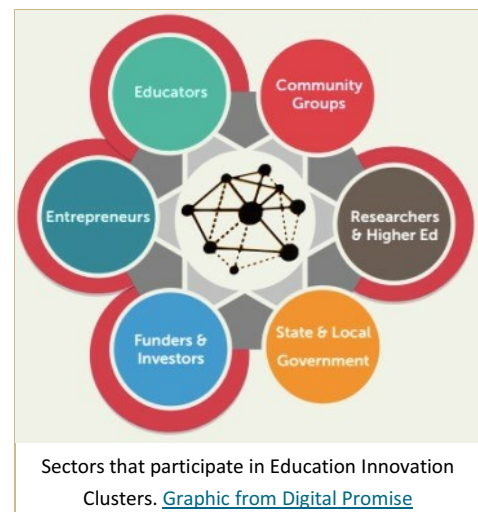
Connected engagement

Schools may also opt to connect directly with organizational partners to offer a particular set of Wider Learning Ecosystem opportunities to their learners. This model offers the advantage of creating opportunities for a school's entire student body, rather than relying on individual learner initiative (though within the partnerships, schools can still require learner initiative to locate and pursue particular learning opportunities). Further, some schools may see this model as easier to manage and quality-assure than individually-facilitated WLE learning, and the partnerships they pursue may further broader school/community goals.

Connected engagement often involves one-to-one partnerships between a school and one (or more) local companies, nonprofits, or community organizations for identified purposes. Schools might have such a partnership with a local community college for dual enrollment or early college programs,⁴⁰ and/or with a local nonprofit that manages middle school shadow programs and high school internships.⁴¹ Establishing and managing these partnerships is a major undertaking, but can leverage broader innovation. Resources, toolkits, and exemplar cases provide guidance on setting up and managing such partnerships.⁴²

"Hives are comprised of organizations (libraries, museums, schools and nonprofit startups) and individuals (educators, designers, community catalysts and makers). **Together, they create opportunities for youth to learn within and beyond the confines of traditional classroom experiences**, design innovative practices and tools that build the field for greater impact, and contribute to their own professional development within an active community of practice."³⁹

An alternative partnership model is to join in a multi-partner collective impact initiative⁴³ with an existing (or forming) initiative. High-profile examples of learning collectives include [Hive](#) and [LRNG](#) (introduced in Report 4) and [Education Innovation Clusters](#) such as [Remake Learning](#) in Pittsburgh⁴⁴ (see also the brief description of Hive in the box to the right). Hive and/or LRNG networks exist in more than a dozen US cities as well as globally, and other types of collective impact partnerships that include learning as at least part of their purpose also exist in some form in other cities and rural regions. The community-mediated learning zone section later in this report has more on this collective approach, as will the forthcoming MyWays Wider Learning Ecosystem resource. Full participation in this kind of collective impact requires a significant commitment, but also provides a potentially transformative way to engage learners with a participatory local learning ecosystem that offers not only an exciting, broad range of learning experiences, but also offers opportunities to build social capital that will serve participants well when they transition into the local work/learn landscape. For some insight into the process of creating such a network, see the [Remake Learning Playbook](#), which covers "the



theory and practice of building learning innovation networks, the resources and strategies required to put networks into action, and the impact of the network in schools, museums, libraries, communities, and more.”

Facilitated engagement

In this model, the school’s role is to *facilitate the engagement of individual learners with organizations or experiences of their choice within the Wider Learning Ecosystem*. This may entail, for example, helping a student locate opportunities and navigate connections, as well as overseeing quality and outcomes. This model can be implemented on a limited front or become the core of the educational experience. On the more limited end, some high schools let learners take part in WLE learning for a few courses or credits of their curriculum or outcome requirements. Such schools may have one WLE facilitator to help guide and monitor students who are self-directed enough to organize an experience (such as an internship, service learning, or an independent online learning course for credit).

At the other end of the spectrum are schools that are all about facilitation. The [Virtual Learning Academy Charter School](#) (VLACS), an NGLC grantee, has created an entire online system designed and built to support WLE learning in project- and competency-based ways; that system is now available for use by any individual student, school, or district in the country. Students can create their own flexible learning pathways of defined competencies through a mix of online courses, real-world projects, internships, and other experiences to earn a high school diploma. Relationships with their teachers, their college, career, and citizenship counselors, and their skills coaches are central to making this system work.⁴⁶

“Students will have the option to meet competencies in the learning environment that best fits their needs. This may mean that a student starts their study of English by interning at a local newspaper (LTE), completing two career related projects (LTP), mastering two English competencies while taking a college course, and completing the competency group known as English I by enrolling in two modules of an online course.”

—Steve Kossakoski, VLACS⁴⁵

Many next generation learning models offer education that is personalized within the school or program, though few models accomplish this personalization by facilitating individual student-initiated access to diverse wider ecosystem learning on a large scale. Schools with integrated models, such as Big Picture, Da Vinci, and Del Lago Academy, often support this approach as well. For examples, see individual stories in Living Your Future’s [blog on Nashville Big Picture High School](#) and DaVinci Schools’ new non-classroom-based independent study [RISE High](#), opened in fall 2017, to serve homeless, foster youth, and other students with diverse learning needs.

Other design considerations for WLE experiences and systems

Practitioners convinced of WLE’s significant value may wish to know more about how to design it into a new learning model, how to introduce it to an existing school-based design, or to how to build on a few successful but isolated real-world components. In our forthcoming MyWays WLE resource, we will explore these issues further, as well as curate existing tools to support the various development processes. *Here, we highlight a few key issues and considerations flagged by our initial scan.*

Essential design components

Two components that are clearly central are developing partnerships and establishing the necessary support infrastructure; the nature of each will depend on the engagement model you choose.

Partnerships that employ design thinking

Working outside school walls naturally calls for working with either organizations or individuals who live and work out there. Michele Cahill's take emphasizes the centrality of such partnerships, as well as the agile, iterative way they need to work:

“[W]e needed to redefine ‘school’ as a porous organization and redefine ‘partnership’ as a core design element, not an add-on. When partnership is a core element of school design, students have opportunities for relationships with adults and experiences that literally expand the world that is well-known to them through connections with cultural organizations, professional and business settings, science and technical organizations, or community services.... Partnerships that are designed as core to schooling also can expand and deepen curriculum through themes, project-based learning, internships, student research, and expeditions. Design thinking gives real roles to partner organizations in a learning ecosystem.”⁴⁷

Tom Vander Ark's [interview with Cahill](#) (12m) offers more on partnerships, listening for discussion of design elements and principles, as well as the different types of partners. See also the Hive Learning Network and its collective impact partnership's [five core principles](#) — creative & innovative, collaborative & cooperative, experimental & catalytic, relevant & consequential, equitable & open, and engaging & participatory — as well as Remake Learning's [seven lessons learned](#) from its networking efforts over the past decade.

A broader, deeper support infrastructure

As our WLE construct suggests, appropriate supports are essential if learners are to benefit optimally from WLE learning. Given the nature of the wider ecosystem learning experience (increased learner agency, enhanced choice, new environments, more complexity, and greater real-world challenge), we urge educators to find inspiration in excellent youth development and school models that incorporate greater personalization and experiential learning programs (see the links at various points in this and other reports), as well as in Report 4's MyWays Developmental Framework for Social Capital. A WLE infrastructure will need to emulate this framework's attention to fostering well-being and self-exploration while also providing resources to enable learning and accomplishment of goals, all of which are particularly important for learners with social, emotional, or other challenges. Community partners can provide elements of this support, but schools will have to lead or instigate collective efforts on these fronts and ensure that (in all cases) the WLE experiences are integrated with classroom learning. This is likely to call for increased attention to advisories, guidance, coaching, and mentoring for all learners, and, for disadvantaged learners, even more intensive supports similar to those in the youth development programs featured in Report 4.

This support infrastructure will also need to be designed to support individual learner pathways that extend from middle school through to the wayfinding decade and the work/learn landscape described in Report 3 (particularly in the “Takeaway 4” section).

What’s your goal? Depth and stages of implementation

Deeply embedded and integrated Wider Learning Ecosystem learning offers substantial benefits to learners preparing for the complex and uncertain future. However, schools do not need to incorporate WLE into every aspect of their design to incorporate some of its benefits. [Da Vinci Schools](#) and [Big Picture Learning](#) represent one end of the spectrum: WLE design affects all aspects of the schools. (At Big Picture, for instance, “industry/third sector/community partners co-construct the assessment rubrics, so their standards and expectations become part of the school operating system and culture” and “relationships are horizontal, with learning being facilitated by a wide variety of adults and mentors”⁴⁸). However, deep interaction with the WLE can also grow out of a defined service-learning component, such as the [Cesar Chavez School for Public Policy’s](#) progression of increasingly complex service-learning components, or a particular content focus, as in Colorado, where [St. Vrain Valley](#) public school district has partnered with IBM to integrate design thinking across its whole system. Authentic WLE learning can be included solely in parts of your curriculum, course, or schedule, and such opportunities can be implemented in stages over a period of years. One option, noted by Ron Berger of EL Education, is to try turning your field trips into “fieldwork,” having your students conduct research for a productive project by taking notes, taking photos, and interviewing experts.⁴⁹ Regardless of the level of WLE integration, basic cultural and structural changes need to be embraced and implemented from the beginning, including ensuring that at least some opportunities are available to all students (including those with disabilities and at all levels of academic performance); that the learning in the WLE is linked to classroom learning; and that some kind of credit, badging, or evidence of learning outcomes is involved. For an excellent example of badging, see the box on Del Lago Academy’s [Competency X](#) badging system in Report 12.

"At EL Education we use the term fieldwork, rather than field trips....Fieldwork is not sitting on a miniature train looking at sites, and it's not just taking a tour of an historic home or walking through an aquarium. Fieldwork is what adult professionals do: research in the world."

- Ron Berger in Education Week Teacher

What’s your starting point?

Plans for incorporating WLE into a school’s learning model will also depend significantly on where you start and the conditions within which you operate. These are crucial elements of the design picture, and our forthcoming WLE resource will analyze — and perhaps provide a decision tool for — various things you should consider depending on your starting point.

For example, a school already operating its classroom learning within a competency-based framework — but perhaps lacking significant experience working with community partners — will follow a much different path into the WLE than a school that has no track record with competency-based education, but considerable experience with external partners for, say, senior internships. While the former school may need to develop expertise in initiating and managing partnerships and creating a support infrastructure for

students spending time outside the school walls, the latter will need to put much greater thought into how to assess and validate the learning outcomes from new WLE experiences.

Many schools in New Hampshire, for instance, have transitioned to performance-based assessment (through the PACE program) and already address work-study practices (WSPs, which are that state's approach to Creative Know How and Habits of Success). New Hampshire also has a forward-looking Extended Learning Opportunities (ELO) policy, defining ELO as the “acquisition of knowledge and skills through instruction or study outside of the traditional classroom methodology, including, but not limited to, apprenticeships, community service, independent study, online courses, internships, performing groups and private instruction.... School districts do not have to adopt ELOs; however, those that offer ELOs are required to have a policy for granting credits for students who successfully demonstrate competencies as a result of their participation.”⁵⁰ However, even some of the state's districts that are furthest along with performance assessment and WSPs have yet to make significant inroads with experiential learning or increasing learner agency; thus, for these schools, incorporating ELOs/WLE learning would require development in agency and experiential learning areas.

An initial design step, then, would be to assess which (if any) of the following learning approaches are already incorporated into your school model and/or state or district conditions: personalized learning, competency-based education, performance-based assessment, experiential learning (including authentic PBL or related approaches), and learner agency. All of these approaches incorporate learning, assessment, and/or student support components that apply when building out WLE learning — though you may need to enhance the existing components to ensure that they work for the new learning environments and the challenges your students will be encountering.

For those eager to start thinking about WLE design, we heartily recommend reading the compact [Leaving to Learn](#) by Big Picture Learning's Elliott Washor and Charles Mojkowski. The book combines an exploration of the organization's leaving to learn philosophy with excellent lists of criteria, components, principles, policies, practices, and tools from one of the most established practitioners of WLE learning in the field.

Broader systems issues

Several other crucial systems issues must be addressed to successfully implement WLE learning design. Some of these are within the control of educators designing a model; others must be addressed at a larger ecosystem level. These will be explored in the forthcoming MyWays WLE resource; here we highlight two issues likely to require attention at the ecosystem level.

Evidence, assessment, and crediting of learning outcomes

Evidence, assessment, and credit involves a range of issues related to determining what students learn from authentic, complex experiences in the real world: How can we best collect evidence of learning outcomes? Who evaluates that evidence and how? How can learners best reflect on learning in iterative cycles that enable them to improve their skills? Beyond assessment as and for learning, how are such outcomes vetted for badging, larger credentials, and high school credit? Further, will the learning platforms let you store performance evidence so that learners themselves — as well as colleges and

employers — can access that evidence over time? Collecting and crediting learning evidence in the WLE is an emerging art, but various initiatives are attempting to make sense of what’s out there. In our forthcoming WLE resource, we will summarize progress in various badging movements, portable and stackable credentials, high schools providing credit for WLE learning, colleges and companies that assess candidates based on evidence of outcomes from experiential learning, and initiatives such as those in New Hampshire that give credit to prior learning accomplished inside or outside traditional classrooms.⁵¹ We will also look at the extent to which personalized learning and related platforms can facilitate how schools manage wider ecosystem learning and enhance the WLE experience for students. [Project Foundry](#) and SchoolHack’s [LiFT](#), for instance, are designed with PBL and WLE learning in mind, while Big Picture Learning’s [ImBlaze](#) platform was designed to help run internship programs so that they connect to academics and carry as much learning value as possible. Summit Public School’s [Summit Learning Platform](#) and InnovateEDU’s [Cortex](#) are also targeted at the kind of personalized, competency-based learning found in the WLE.

New educator competencies and roles

If educators within the school walls have yet to move from imparting knowledge to guiding student learning, this mindshift will need to be embraced in wider ecosystem learning. Nurturing educator support for a new vision can be challenging; change management for incorporating WLE learning will need to address this as well. Models in which WLE is fully integrated have nuanced educator recruitment, professional learning and practice, and a well-developed culture that engrains the value of authentic learning in the real world. Such models also have adapted educator roles to support both academic and social-emotional learning in that context. Big Picture Learning, for instance, already employs specialists who identify leaving to learn opportunities and establish relationships with mentors and coaches.⁵² In Report 7, we highlight schools that incorporate more adults with backgrounds in social work, psychology, counseling, and related fields into their core teams. Some might find Powderhouse Studio’s inclusion of a project manager on each learner support team surprising. However, if WLE learning continues to increase, we could soon see new educator roles similar to those projected by KnowledgeWorks: community intelligence coordinator, social capital platform developer, learning journey mentor, and education surveyor. Further, competency trackers could “tag and map community-based learning opportunities for competencies addressed”; learning naturalists could design assessments “to capture evidence of learning in students’ diverse learning environments and contexts”; and micro-credentialing analysts could “provide research-based comparative quality assurance metrics.”⁵³

More on the Wider Learning Ecosystem zones

The opportunities for learning anytime and anywhere, through organized programs, crowd-sourced initiatives, civic organizations, community maker spaces, online communities of practice, and even paid task work that also tracks competencies developed are proliferating. So, to end this section, we return to the five zones of opportunity for robust WLE learning. For further examples of learning in each zone, an analysis of zone characteristics — including common learning experience design, key zone institutions, and zone-specific partnership and funding considerations — and leads to tools and resources to help educators engage in each zone, see the forthcoming MyWays WLE resource.

School-based extracurriculars

A high school student once said to us, “I have a different idea for flipped learning. Why can’t we flip the way we learn in our extracurriculars into the main parts of the school day!” Jal Mehta makes this very argument in an excellent [blog](#) that asserts the “periphery” of schools is often “more vital than the core.” He teases out a set of characteristics that differentiate a high school theater program from standard academic learning — factors such as external audience, apprenticeship learning from near-peers, and the development of mastery, identity, and creativity.⁵⁴ *Extracurriculars cover a range of activities*; those of greatest value are *as fully student run as possible*, and involve a *real-world experience or task*. Robert Putnam summarizes the impressive range of “measurably favorable” outcomes for involvement in extracurriculars, even after controlling for family income and other variables: better academic performance and labor market outcomes, better work habits, higher aspirations, and college attendance. One study showed that those consistently involved in extracurriculars were 70% more likely to go to college.⁵⁵

- **Co-curriculars** are school-based activities that align closely with curricular academic subjects, such as science fairs, history fairs, and model United Nations. These co-curriculars can offer many of the “periphery” benefits discussed above, depending on the degree of learner self-direction involved and the authenticity of the activity. Some science and history fair projects, for example, can provide authentic experiences of what being a scientist or historian is actually like (rather than just “studying” science or history), particularly if students seek out professionals to mentor them in their research.
- **Extracurriculars** include theater, dance, and music productions; newspapers and literary magazines; and public service activities such as community action, environmental clubs, and Interact clubs. Such activities also offer opportunities for students to experience the benefits enumerated by Mehta above.
- **Business, science, and other career-oriented national extracurriculars** such as DECA, Virtual Enterprises (VE), Junior Achievement, and First Robotics, have clubs or chapters at a range of high schools and provide an additional outlet for Whole Learning in a real or virtual setting. In VE, for example, simulated businesses trade with 5,000 other VE firms in the US and globally using a Web-based simulated banking system.

College-based learning

While based in structured educational institutions, college-based learning offers high school students a vital opportunity to expand their horizons, not just by opening up a vastly expanded set of subject learning, but also by offering students chances to develop more independent study skills and other Habits of Success; interact with near-peers who can act as role-models for academic and social growth; gain access to additional adult mentors and brokers; and gain additional lines of sight to careers. Three of the most commonly used paths in this learning zone include *dual enrollment*, *early college high schools*, and *individual access to credit and noncredit college offerings*.

- Successful **dual enrollment** programs, in which high school students enroll in college courses for credit from both institutions, require co-design, co-delivery, and co-validation by the participating high school and college partners, but the results for high school engagement and postsecondary success are worth it. For more on these outcomes, see this Jobs for the Future [report](#), and What Works Clearinghouse [summary of research and outcomes](#).
- **Early college high schools** offer the opportunity to earn both a high school degree and an associate’s degree during the high school years. Examples here include the established [Bard Early College network](#) and the [Middle College High School](#) in Santa Ana, California, where the majority of seniors earn an associate’s degree before graduation; see also the [early college design features](#) of Jobs for the Future’s early college initiative.
- **Individual access to credit and noncredit bearing college courses** can also benefit learners. These learners might range from high schoolers looking for an academic challenge or to explore a more vocationally focused area, to a foodie sixth grader with dyslexia taking a noncredit, all-age community college cooking course, thereby building career awareness, playing to his strengths, and re-energizing his learning soul.

Career-related learning

The purpose of career-related learning is not to channel learners into specific career paths early (especially now that we can't even predict what jobs — or, more likely, project-centered teams — will be available for our learners). Work is a vital part of adult life to which students today otherwise have very little access. Forming an awareness of broad career options helps motivate learning, while participation with adults in communities of practice enhances networks for social capital. There's no better preparation for the “whitewater learning” that students will be doing in the future than to get out (in supported ways) into the work-based world while they can still integrate these experiences with school-based reflection and guidance. Career-related learning stretches from *career awareness and exploration* through *career preparation* and into *training* (for more, see Linked Learning's [Work-based Learning Continuum](#) and related [toolkit](#).)

- **Career awareness and exploration** activities can and should start in the elementary years, bringing people in to talk about their work and getting students out to visit workplaces. [Generation Schools Network](#) (featured in Report 10) starts in sixth grade with exploratory “intensives.” [The Spark Program](#) has three progressive offerings to help middle school students explore themselves and potential careers.
- Internships offer **career exploration and preparation**. [Linked Learning](#), [The National Academy Foundation](#), and [Big Picture Learning](#) (see their internship platform, [ImBlaze](#)) have all been developing their internship practice for years. See also these Teaching Channel [videos](#) on Deeper Learning school internships.
- For learners who have identified career interests early, **career preparation** can take a number of forms. **Apprenticeship opportunities** for high school students are [expanding](#). In addition, as we explore in Report 3, other training options including bootcamps, badges, and certificate programs. While some of these are at the postsecondary level or higher, others are accessible to high school students.
- High school learners who do **paid work**, even without explicit training components, have been shown to improve their academic and life outcomes, provided that their work hours don't extend beyond 15–20 hours per week.⁵⁶

Community-mediated learning

These experiences include participation in the arts and performing arts, world languages, digital media, science, sports and fitness, hobbies, civic engagement, and service opportunities. [Getting Smart's Place-based Education Initiative](#) has curated some excellent practice and resources relating to this zone. Such activities often offer excellent opportunities for learners to exercise choice and develop Habits of Success and Creative Know How.

- **Individual community-based learning providers** include libraries, museums, parks and rec departments, science centers, community centers, youth centers, YMCAs, and other traditional out-of-school time (OST) providers, which have been joined by community-run maker spaces, robotics clubs, and urban farms.
- **Afterschool and other programs based on active youth development principles** offer rich opportunities for developing the broader competencies and student agency as the programs have been targeting these qualities for years. (The MyWays framework incorporates youth development principles and encourages educators to learn from experienced youth development practitioners.) For examples, see [Preparing Youth to Thrive](#), a field guide based on the practices of eight exemplar OST sites, with key program features and indicators. Youth action experiences, which engage learners in social justice and civic education change, can be particularly valuable.
- **Emerging collective networks**. In response to the fragmented provision of learning opportunities, a number of place-based initiatives have evolved. Among others, [LRNG](#) aims to “harness the assets of a community and transform it into a network of seamless pathways of in-school, out-of-school, and online experiences” in over a dozen cities. [Hive Learning Networks](#), in five US cities, “empowers educators to build connected learning experiences...” through involvement with libraries, museums, schools, and nonprofit startups, as well as with individuals such as educators, designers, community catalysts, and makers. Meaningful participation in a collective ecosystem could provide transformational leverage for incorporating WLE into school design.

Every day informal and formal learning

In addition to the WLE zones mentioned above, the prospects for learning in formal and informal ways extend as far as curiosity itself. This zone encompasses anytime and everywhere learning, directed at any subject or outcome, which learners might pursue through any media or personal connection, for purposes ranging from just-in-time “need to know” learning to being drawn to learn a skill simply because it brings them pleasure. We highlight segments such as the *growing prospects for online learning* and the often-overlooked *informal learning with family and friends*.

- **Online learning** incorporates a range of activities, including taking online courses independently or as arranged through one’s school; pursuing online learning for course credit, vocational certification, or just to learn something; taking a self-paced, unsupported course or one that offers a supported or even blended learning opportunity. Schools offering learners access to these options need to design their support infrastructure to ensure age-appropriate support for successful learning. Of course, as mentioned in Report 4, online learning can also include simply tapping the knowledge of others through YouTube or Quora archives.
- **Participation in online communities of practice** offers excellent opportunities for Whole Learning based on real-world feedback, in addition to the potential to build social capital and create early inroads into the work/learn landscape. The best known [examples of this](#) currently come from programming, such as StackOverflow, a programming social network where participants earn badges and accumulate reputation points for their contributions. However, as work in different fields moves online and [becomes more distributed](#), opportunities will increase in other areas as well. Also, age is not a barrier in these communities. Jaiken was a New England seventh grader when he joined a Minecraft server during the game’s beta release and started asking good questions; for more than a year, the server administrator in Florida coached him in setting up and running his own server for friends at his middle school. He learned not only how to run a server, but also how to manage an online community and interact productively with a mentor.
- **Informal learning with family and friends**, often an overlooked set of activities, can indeed contribute greatly to the development of the broader, deeper MyWays competencies. The Global Family Research Project’s [Finding Time Together: Families, Schools, and Communities Supporting Anywhere, Anytime Learning](#) provides an excellent set of insights into this zone. Family responsibilities, such as looking after siblings or participating in a family business, often entail substantial learning — both of specific skills and of Habits of Success. And involvement in the interests of friends and neighbors can turn into learning activities that spark personal growth and even career interest.
- **Homeschooling and unschooling**. More formal (or in many cases, simply more intentional) than the types of learning in the previous bullet, homeschooling continues to increase significantly in the US.⁵⁷ The homeschooling community and organizations that serve it are rich sources for educators looking for ways to pursue more personalized, real-world approaches to learning. Also, lines are blurring as homeschoolers use online courses, [apps](#), museum courses, and other local resources that can also be accessed by school-based students as part of their own learning mix. Furthermore, in some places, the walls between homeschooling and traditional schools are becoming more porous; see, for example, [DaVinci Schools’](#) Homeschool Hybrid Program (two days of PBL at school mixed with three days of family-facilitated learning off-site) and Homeschool Collaborative Program.

Incorporating these five zones of experience expands opportunities for Whole Learning in ways that are essential to prepare students for an age of accelerations. To deepen this work across the full range of competencies in both the school setting and the Wider Learning Ecosystem, we offer a set of eight neuroscience-based practices we call Levers for Capability and Agency.



LEARNING DESIGN CONSTRUCT 3: Levers for Capability and Agency

*If teaching were the same as telling,
we'd all be so smart we could hardly stand it.*

—Mark Twain⁵⁸

This section discusses the eight levers that can activate capability and agency — the two necessary ingredients of any broader, deeper competency (see the graphic below). Briefly introduced in Report 5, these levers are grounded in brain science and learning science.

In Report 5, we noted that *the acquisition of capability and agency* is one of the crucial developmental tasks for today's apprentice-adults (adolescents). We define *capability* as “knowledge and the understanding to use it in real-world situations” and *agency* as “a deep and durable self, acting to shape one's development and environment.” In its influential report, *Education for Life and Work*, the National Research Council (NRC) underscores that, in the 21st century, competence means “an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer).” As we have demonstrated in Part A, transfer of learning to real-world situations is increasingly challenging for today's adolescents, who confront societal conditions such as the 5-5-5 Realities involving

Eight levers activate capability and agency which combine to create competence in any pursuit



employability, learning beyond high school, and social capital. The NRC concluded that many traditional forms of K-12 education produce very low levels of transfer.

Report 5 went on to describe agency as a form of acting and improvising upon our environment, which is a process that can be learned and mastered. Often, we act and improvise through the people in that environment — parents and siblings at home, friends and strangers in the neighborhood, or fellow students and teachers at school.⁵⁹ Accordingly, agency can be badly blunted by adverse life experiences that weaken our trust in others and our sense of control and influence over our environment and circumstance. In addition, agency is situational — we may feel confident and self-empowered in one arena, and uncertain and powerless in another. Finally, a three-part process comprises agency: the ability 1) **to retrieve** relevant prior knowledge and experience; 2) **to project** alternative courses of action and their likely outcomes based on that retrieval; and 3) **to elect** the course of action that judgment deems best. These same basic steps apply in school, work, relationships, and independent living. As the authors of *Make It Stick: The Science of Successful Learning* say: “At the root of our effectiveness is our ability to grasp the world around us and to take the measure of our performance.”⁶⁰ Further, as Halpern, Siegel, and Steinberg each stress, the adolescent brain is primed for this work, but young people cannot do it alone (Report 5).⁶¹

The Levers for Capability and Agency offer next generation educators guidance on interactions and learning experiences that are likely to help apprentice-adults acquire capability and agency. To identify strategies that work, we examined the growing body of evidence in cognitive psychology and neuroscience. *Make It Stick* has been of particular value. A collaboration of two cognitive psychologists, Henry Roediger III and Mark McDaniel, and writer Peter Brown, the book explores the neuroscience of learning, memory, and mastery. At the heart of this new knowledge are discoveries about creating and strengthening neural pathways — the more connections made and retrievals practiced, the greater our learning, memory, and mastery. A brief clip from the BBC documentary, *The Human Body*, demonstrates this process ([3m video](#)).

Levers for Capability

The first set of levers foster capability — the ability to apply knowledge in new real-world situations. Roediger, McDaniel, and Brown equate capability to mastery:

“Mastery in any field, from cooking to chess to brain surgery, is a gradual accretion of knowledge, conceptual understanding, judgment, and skill. These are the fruits of variety in the practice of new skills, and of striving, reflection, and mental rehearsal. Memorizing facts is like stocking a construction site with the supplies to put up a house. Building the house requires not only knowledge of countless different fittings and materials but conceptual understanding of aspects like the load-bearing properties of a header or roof truss system, or the principles of energy transfer and conservation that will keep the house warm but the roof deck cold so the owner doesn’t call six months later with ice dam problems. Mastery requires both the possession of ready knowledge and the conceptual understanding of how to use it.”⁶² [emphasis added]

Durable Retrieval

The Concept: “Recalling what you have learned causes your brain to reconsolidate the memory, which strengthens its connections to what you already know and makes it easier for you to recall in the future. In effect, retrieval — testing — interrupts forgetting.... Retrieval is most effective when it is spaced, interleaved, and varied.” (*Make It Stick*)⁶³

Discussion: Every time we retrieve information from our brain, neural pathways are strengthened. Every time we retrieve information in a new setting — perhaps a math concept as we are estimating the cost of groceries — that information becomes connected to neural pathways associated with supermarkets, personal budgeting, and mental math tricks. This repeated stimulation of neural pathways explains why cramming for an exam fails to produce durable learning — “practice that’s spaced out, interleaved with other learning, and varied produces better mastery, longer retention, and more versatility.”⁶⁴ Practice spaced out over time provides the brain the opportunity for *consolidation*, which is then retriggered by efforts to retrieve after some forgetting, further strengthening memory.⁶⁵ Interleaving practice with other activities — like learning multiple job tasks in a spiraling fashion rather than one at a time — might feel confusing, “but the research shows unequivocally that mastery and long-term retention are much better.”⁶⁶ Practice across varied settings and requirements “helps us see more nuances”⁶⁷ and fosters better transfer of learning to new situations. Durable retrieval is one of the many levers well integrated into the Whole Learning approach discussed above.

Resources: [Make It Stick](#), pages 1–53. “Teaching for Mastery of Content, Skills, and Concepts,” Report 7 in Mariale Hardiman’s book, [The Brain-Targeted Teaching Model for 21st-Century Schools](#).

Desirable Difficulties

The Concept: As noted in *Make It Stick*, “It’s one thing to feel confident of your knowledge; it’s something else to demonstrate mastery.... When confidence is based on repeated performance, demonstrated through testing that simulates real-world conditions, you can lean into it.”⁶⁸ *Desirable difficulties* are the short-term impediments that make for stronger, more durable learning and capability.

Discussion: According to *Make It Stick*, “Learning, remembering, and forgetting work together in interesting ways. Durable, robust learning requires that we do two things. First, as we recode and consolidate new material from short-term memory into long-term memory, we must anchor it there securely. Second, we must associate the material with a diverse set of cues that will make us adept at recalling the knowledge later. Having effective retrieval cues is an aspect of learning that often gets overlooked. The task is more than committing knowledge to memory. Being able to retrieve it when we need it is just as important.”⁶⁹ *Desirable difficulties*, a term coined by psychologists Elizabeth and Robert Bjork, are the short-term impediments to learning that make the retrieval process work more effectively.⁷⁰ For example, the fifth graders developing their CARES habits in Report 5 (Developmental Task 3) continually encountered short-term impediments throughout the school year. Making the brain work — through spacing, interleaving, variation, and escalating levels of difficulty — requires repeated but non-identical acts of retrieval from long-term memory that “can both strengthen the memory traces and at the same time make them modifiable again, enabling them, for example, to connect to more recent learning.”⁷¹ This *reconsolidation* process is a vital part of acquiring capability and mastery in real-world settings; through desirable difficulties, it is baked into Whole Learning

and related forms of performance/mastery learning and real-world application common in the Wider Learning Ecosystem.

Resources: [Make It Stick](#), Chapter 4, pages 67–101.

Cognitive Apprenticeship

The Concept: *Cognitive apprenticeship* is learning from more experienced others in real-world (*situated*) settings, both formal and informal — through levels of *peripheral participation* from observation to active involvement.⁷² Knowledge is shared through modeling, conversing, and coaching.⁷³ “A major advantage of learning by cognitive apprenticeship as opposed to traditional [decontextualized] classroom-based methods is the opportunity to see the subtle, tacit elements of expert practice that may not otherwise be explicated in a lecture or knowledge-dissemination format.”⁷⁴ Further, in apprenticeship, “the processes of thinking are visible.”⁷⁵

Discussion: Next generation educators can employ the cognitive apprenticeship lever to foster capability by locating students with real-world practitioners or more experienced near-peers. For tens of thousands of years, children and young people became competent in the ways of the adult world through the natural, universal process of cognitive apprenticeship — acquiring knowledge, physical skills, and cognitive abilities through their social proximity to adults and *more knowledgeable others*.⁷⁶ When young people can observe, practice, and reflect on how adults and near-peers are working and interacting in authentic settings, they come to better understand the adult world, the relationship of knowledge, skills, and learning to that world, and the different ways they can best apply their abilities.⁷⁷ As John Seely Brown and his colleagues emphasize, “The central issue in learning is becoming a practitioner, not learning about practice.”⁷⁸ A century ago, young people had ample opportunities for cognitive apprenticeship — adolescent isolation from the adult world was not nearly as extreme as it is today. We need to dramatically reverse course: one of the most effective ways for young people to acquire the broader, deeper competencies they will need in the adult world is through the re-deployment of cognitive apprenticeship — removing the curtain between adolescence and the adult world, and offering the modeling, conversing, and coaching they require to learn and grow.

Resources: [The Cognitive Apprenticeship Model in Educational Practice](#) by Vanessa Dennen and Kerry Burner. [Two-page summary of Situated Learning](#) by the Faculty Development and Instructional Design Center at Northern Illinois University.

Authentic Success

The Concept: Successful experience in the adult world — particularly “deep inside some particular discipline, set of ideas, or social practice”⁷⁹ — helps young people develop capability, grow in approaching and carrying out tasks, and map the linkages between learning, schooling, and vocation.⁸⁰ Proper amounts of struggle and failure in response to desirable difficulties fosters a deeper understanding of the world, the value of skills and mastery, and a growth mindset; however, undesirable difficulties can overwhelm the beginner mind with negative consequences in the longer term.

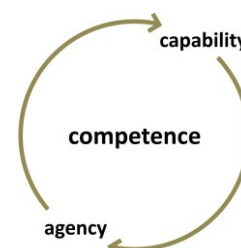
Discussion: The previous lever, *Cognitive Apprenticeship*, focuses on the benefits of learning from others in real-world (*situated*) settings within school or the adult world. In contrast, *Authentic Success* focuses on the benefits of experiencing success in such settings — in a school theater or musical production, a youth action project in the community, or in the workplace. Success literally changes the brain far more than failure.⁸¹ The experiences that change lives are often successful ones, providing, according to adolescent psychologist Robert Halpern, “a self-narrative in relation to school that supports engagement, persistence, and risk taking and that gives school personal

meaning. They have to find a way to understand school as a resource, not a passport or a set of externally imposed obstacles.”⁸² Success is the proof point that one’s efforts are worthwhile. Tasting authentic success may be a new and important experience for many less advantaged students, such as those learning bike mechanics at an alternative high school in Sacramento to transform donated bikes into special gifts and proud possessions. Accordingly, creating conditions for authentic success is a key tenet of positive youth development.⁸³ An important part of learning to succeed is working through failures and exposing our “illusions of knowing.”⁸⁴ The confidence to do this is a key to entrepreneurs’ success, Amir Bhidé finds. Rather than study an opportunity from afar, their strategy for success is to dive in and swim: to immerse one’s self in a new or uncertain situation; encounter surprises and setbacks; and figure out ways through them, much like students working toward mastery in a Whole Learning junior version described earlier in this report.

Resources: *The Means to Grow Up: Reinventing Apprenticeship as a Developmental Support in Adolescence* by Robert Halpern, pages 163–188. *Make It Stick* on failure and learning (pages 90–94) and illusions of knowing (pages 102–130).

Levers for agency

A reader could argue that, in addition to building capability, Authentic Success is achieved when learners act on their environment, accomplish something meaningful, find success, and thereby experience positive reinforcement that fosters agency. True! Capability and agency are inexorably blended in any competence. Accordingly, while Authentic Success, as well as Durable Retrieval, Desirable Difficulties, and Cognitive Apprenticeship, clearly build capability, these same levers can also build agency when properly applied. The same is true in reverse. In reading the following discussion of the four levers for agency, it is helpful to consider how each might also build capability.



Earlier (and in Report 5), we discuss the fundamentals of agency: acting and improvising upon our environments, feeling different levels of agency in different environments, the importance of trust and a sense of control, and the retrieval-projection-action process at the heart of all agency. Agency also has a higher dimension: it is the cornerstone of human aspiration and potential. Here, John Taylor Gatto, author and former New York Teacher of the Year, raises our sights:

Whatever an education is, it should make you a unique individual, not a conformist: it should furnish you with an original spirit with which to tackle the big challenges; it should allow you to find values which will be your road map through life; it should make you spiritually rich, a person who loves whatever you are doing, wherever you are, whomever you are with; it should teach you what is important, how to live and how to die.⁸⁵

Helping set the stage for the four agency levers that follow, youth activist Roberto Rivera emphasizes that young people “just need someone to journey with them, to help them find that spark, and to fan that spark into a flame that can not only ignite their education and academic learning, but might even illuminate and revolutionize this world.”⁸⁶

Scaffolded Self-Management

The Concept: Agency that is internal to broader, deeper competencies (“a deep and durable self, acting — through any given competency — to shape one’s development and environment”) is cultivated through external learning experiences that scaffold self-management thinking. Robust neural networks for self-management grow from the same learning activities described earlier: effortful retrieval through spaced, interleaved, and varied practice; desirable difficulties; and opportunities to disabuse illusions of knowing (all present, by the way, in Whole Learning).

Discussion: With next generation educators in mind, we highlight here the *Ready by Design* report on youth readiness. Self-management is similar to the 10 readiness abilities at the heart of the *Ready by Design* framework. These abilities are expressed as metacognitive (agentic) statements such as, “I can apply learning in the real world to meet life demands” and “I can feel and express emotion appropriately and as a way to connect to others.” Each of the statements can be applied not only to a young person’s overall readiness, but also to the agency and metacognition within individual competencies (such as the Math Core or Communication & Collaboration) as a young person uses the competencies to navigate the work/learn landscape. In addition, *Ready by Design* provides substantial guidance on scaffolding the development of these abilities through developmental environments, relationships, experiences, and the ways young people use space and time. The authors present a useful cross-disciplinary synthesis of youth readiness, identifying characteristics of best practice and describing common readiness traps to avoid. (For an example of scaffolding self-management, see the case of Terry Bolduc’s fifth graders in Report 5.)

Resources: [Ready by Design: The Science \(and Art\) of Youth Readiness](#) and [Preparing Youth to Thrive: Promising Practices for Social & Emotional Learning](#), both from The Forum for Youth Investment. [Foundations for Young Adult Success](#) by Jenny Nagaoka, Camille Farrington, and others, from the UChicago Consortium on School Research.

Supported Self-Reflection

The Concept: “Children learn through developmental experiences that combine *Action* and *Reflection*, ideally within the context of trusting relationships with adults.”⁸⁷ (*Foundations for Young Adult Success*) A productive form of retrieval practice, reflection helps create meaning and the capacity to change and adapt.⁸⁸ *Supported* self-reflection means adults have created the time, safe space, responsive practices, and staff supports to make reflection effective in building agency in both learning and in navigating the work/learn landscape.⁸⁹

Discussion: *Foundations for Young Adult Success* places *action* and *reflection* at the heart of their developmental framework. The report’s Action Reflection Cycle (see the graphic at right) is an excellent entry point to self-reflection and its linkage to agency, describing reflection experiences (*describe, evaluate, connect, envision, and integrate*). Although, historically, American schools were not designed to address self-reflection beyond the narrow boundaries of academics, the age of accelerations now makes it a priority. Fortunately, educators can call on self-reflection practices from youth development, cultural responsiveness,

The Action Reflection Cycle at the heart of the developmental framework in *Foundations of Young Adult Success*



Source: UChicago Consortium for School Research

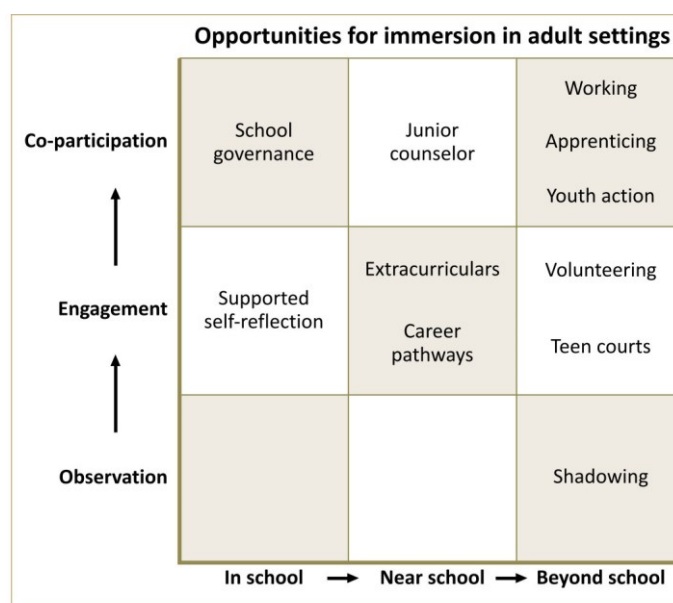
critical consciousness, and trauma-informed care. One universal tool for promoting self-reflection is the Question Formulation Technique in *Make Just One Change: Teach Students to Ask Their Own Questions*.

Resources: The Action Reflection Cycle section of *Foundations for Young Adult Success*, pages 39–52. *Preparing Youth to Thrive: Promising Practices for Social & Emotional Learning*, pages 18–31. *Make Just One Change: Teach Students to Ask Their Own Questions* by Dan Rothstein and Luz Santana. Self-reflection is also discussed throughout Report 12, *Assessment Design for Broader, Deeper Competencies* in the *MyWays Student Success Series*.

Immersion in Adult Settings

The Concept: “The most interesting and compelling role for vocationally oriented learning is personal. It fosters maturity and nurtures a sense of personal competence and of having a place in the world.... To grow up, young people... need what they cannot create or provide themselves: access to the ‘shared reservoir of accumulated ideas, skills and technologies that constitute the richness of culture and provide some scaffolding for maturing.’”⁹⁰ (Robert Halpern)

Discussion: Just six to eight generations ago, children and adolescents were immersed in the work of the family farm or shop, frequently co-participating with adults throughout the community. Over time, as Robert Epstein documents in *Teen 2.0*, social norms and regulation have contributed to the adolescent isolation we see today.⁹¹ If young people are once again going to gain agency, maturity, and knowledge of the world, they need not only the opportunity to develop capability through Cognitive Apprenticeship (above) but also exposure and familiarity — and agency — within the sociocultural dimensions of the adult world gained through greater observation, engagement, and co-participation with adults in school, near school, and beyond school. A few examples are noted in the accompanying graphic. Halpern calls on all adult institutions to rise to this challenge, emphasizing that “it takes a whole society.”⁹² Immersion in adult settings is one key aspect and benefit of creating more explicit and integrated access to the Wider Learning Ecosystem discussed above.



Resources: *Youth, Education, and the Role of Society* by Robert Halpern, particularly pages 1–52. *Leaving to Learn* by Elliot Washor and Charles Mojkowski. *It Takes a Whole Society* by Robert Halpern.

Maker Empowerment

The Concept: “I do not think there is any thrill that can go through the human heart like that felt by the inventor [seeing] some creation of the brain unfolding to success.”⁹³ (Nikola Tesla) When young people apply their knowledge, skills, and aspirations to bring something new into the world, they begin to “understand themselves as designers of their worlds”⁹⁴ and thus develop stronger agency. Making, tinkering, and inventing can be empowered in a wide array of maker spaces: physical labs and shops, extracurriculars (including theater, music, and tech clubs), community youth action projects, gardens and nature centers, digital environments, workplaces, and classrooms.

Discussion: Adolescent psychologist Reed Larson stresses that the very nature of agency must be different in an uncertain, disorderly world: with less precedent and causality upon which to gauge action, young people today need to be highly adaptable, agile, and improvisational.⁹⁵ As TED owner Chris Anderson says: “We are all designers now. It’s time to get good at it.”⁹⁶ Maker empowerment that exercises design thinking in increasingly authentic settings is one of our most powerful levers for cultivating maker/improviser agency. For an inspiring demonstration of maker-driven agency, watch Roberto Rivera’s TEDx talk ([19m video](#)). Agency is evident when young people taste maker/inventor success, as MIT professor Neil Gershenfeld, a pioneer in the maker movement, describes: “Once students mastered a new capability, such as waterjet cutting or microcontroller programming, they had a near-evangelical interest in showing others how to use it. As students needed new skills for their projects they would learn them from peers and then in turn pass them on.”⁹⁷ Agency by Design’s research shows that “maker-centered activities are situated in flexible and often sprawling sociocultural networks” and that learning to both draw from and give back to those networks is a powerful benefit — one that lends itself to utilizing the assets of the Wider Learning Ecosystem described earlier.⁹⁸ We conclude this discussion with a key maker concept known as *Papert’s Principle*, named for the father of the maker movement, MIT polymath Seymour Papert: “Some of the most crucial steps in mental growth are based not simply on acquiring new skills, but in acquiring new administrative ways to use what one already knows.”⁹⁹

Resources: [Maker-Centered Learning: Empowering Young People to Shape Their Worlds](#) from Agency by Design at Project Zero. [Invent to Learn: Making: Tinkering, and Engineering in the Classroom](#) by Sylvia Libow Martinez and Gary Stager. For related information, see Report 8, Creative Know How — for a Novel, Complex World.

These eight Levers for Capability and Agency work in harmony with Whole Learning and the Wider Learning Ecosystem. In a well-designed Whole Learning junior version, for example, many of the levers’ neural strengthening exercises are embedded in the Whole Learning design principles such as working on the hard parts, learning in a variety of settings, and uncovering the hidden rules. Similarly, acquiring and applying knowledge across the five experience zones of the Wider Learning Ecosystem creates ample opportunities to use the levers to deepen capability and agency.

Our concluding vignette, in which you will recognize many elements of Whole Learning and extensive engagement with the Wider Learning Ecosystem, provides an excellent example of the application of all eight of the Levers for Capability and Agency.

An Example of a Real-World Project Employing All Eight Levers

The following vignette was provided by Aaron Vanderwerff, director of the Creativity Lab at the Lighthouse Community Charter School in Oakland, California. It appears in *Maker-Centered Learning: Empowering Young People to Share Their Worlds*, the book by the team at Agency by Design. Each of the levers can be found or inferred in the example.

	<i>“Convert a gasoline truck to electric power—for real? We thought you were joking!”</i>
Maker Empowerment	<i>And with that it was on—Roberto, Cesar, and Tomas would spend much of their extra time in the spring of their senior year working to convert a twenty-year-old truck from gasoline to electric power as the final project for their Making elective.¹⁰</i>
Durable Retrieval	<i>Along the way they learned to weld, read circuit diagrams, and machine parts for the truck. But those weren’t the most important benefits of taking on this project.</i>
Desirable Difficulties	
Immersion in Adult Settings	<i>Early on the young men needed to find money to pay for the project. So together, they applied for a grant through our local utility company and were funded. Then the guys scoured Craigslist for a truck that would be ideal for a conversion. They called innumerable strangers, dealt with the idiosyncrasies of used automobile sales, and eventually bought a vehicle and got it to the school parking lot. They borrowed an engine hoist to remove the engine, found a conversion kit, learned to collaborate with their mentors, and called electric vehicle (EV) conversion companies for technical information. If you’ve ever worked with high school students, you know how hard it can be to get them to make a call to a stranger, but these guys were on fire.</i>
Cognitive Apprenticeship	<i>The pinnacle of their journey was when they drove from Oakland to Sebastopol—a small town culturally a world away. There they got help from an EV enthusiast to machine their own adapter plate, the part that would connect their new electric motor to the existing transmission. At that point, I knew the boys were onto something special.</i>
	<i>Through this project Roberto, Cesar, and Tomas were empowered to do things they would not have dreamed of doing previously. Tomas was even talking about opening up his own conversion business after graduation.</i>
Scaffolded Self-Management	<i>The most amazing thing was the effect this empowerment had beyond their making elective class. Two of these young men were in danger of not graduating. Their writing wasn’t strong enough in Humanities and they weren’t attending office hours to get support from their teacher. But a few weeks after they started working on the truck, their Humanities teacher told me they had started attending office hours, and their writing was improving. After all, if they could convert a truck to electric power through persistence and effort, surely they could pass Humanities.</i>
Supported Self-Reflection	
Authentic Success	<i>They graduated that spring.</i>

Using Whole Learning, the Wider Learning Ecosystem, and Levers for Capability and Agency, along with other next generation learning approaches, to develop competencies needed in an age of accelerations brings us to the final question in the four-part MyWays Through-line: HOW do we gauge students’ progress in developing these competencies? How can we measure our school’s success beyond proficiency in math and ELA to embrace whole child development? We turn to these questions in the series’ final report, *Assessment Design for Broader, Deeper Competencies*.

A quick dive into broader, deeper learning design resources

Because the purpose of the MyWays Student Success Framework is to provide a rosetta stone for thinking about the broader, deeper, future-ready goal-line for today's learners, we have focused on describing that goal-line in conceptual terms. We also believe deeply that school designers, educators, and individual learners need to invest in constructing and evolving their own goal-lines within the broader framework.

In doing this work, educators may find the following resources helpful:

Starter Resources for Learning Design for Broader, Deeper Competencies

This list highlights some core resources from this report, to help facilitate deeper thinking on authentic learning. There are separate boxes below on tools for learning design.

Resources on Personalized and Next Generation Learning (the broad view):

- Robert Halpern, [*Youth, Education, and the Role of Society: Rethinking Learning in the High School Years*](#)
- Education Reimagined, [*A transformational vision for education in the US*](#)
- LEAP Innovations, [*LEAP Learning framework for personalized learning*](#)
- Next Generation Learning Challenges, [*About Next Gen Learning*](#) video (2m)

Resources on Whole Learning:

- David Perkins, [*Making Learning Whole: Seven Principles of Teaching Can Transform Education*](#)
- Jal Mehta, [*"Schools Already Have Good Learning, Just Not Where You Think,"*](#) Learning Deeply blog, *EdWeek*
- Grace Belfiore for NGLC/MyWays: [*"Hard to Do Well: PBL and Authentic Learning Design,"*](#) and [*"Embracing the Hard Parts: 8 Video Resources for Authentic Learning Design,"*](#) Learning Deeply blogs, *EdWeek*
- Thomas Markum, [*"How PBL Educates the Whole Child,"*](#) *Edgeeducation* blog

Resources on Wider Learning Ecosystem:

- Elliot Washor and Charles Mojkowski, [*Leaving to Learn: How out-of-school learning increases student engagement and reduces dropout rates*](#)
- Education Reimagined, [*A transformational vision for education in the US*](#)
- The Aspen Institute, [*Learner at the Center of a Networked World*](#)
- Digital Promise's [*Education Innovation Clusters*](#) work; [*Hive Learning Network*](#); and the [*Remake Learning Playbook*](#) for building learning innovation ecosystems.
- Big Picture Learning, [*"Leaving to Learn" video*](#) (4m)

Resources on Levers for Capability and Agency:

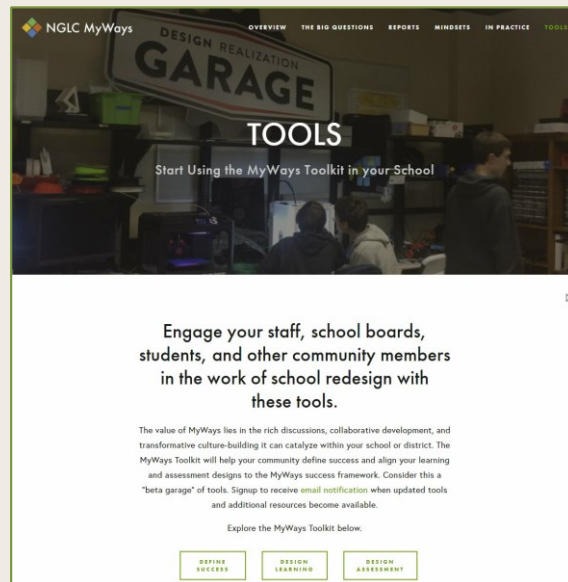
- Peter Brown, Henry L. Roediger III, and Mark A. McDaniel, [*Make It Stick: The Science of Learning*](#)
- Robert Halpern, [*Youth, Education, and the Role of Society*](#)
- Vanessa Dennen and Kerry Burner, [*The Cognitive Apprenticeship Model in Educational Practice*](#)
- Edward P. Clapp, Jessica Ross, Jennifer O. Ryan, and Shari Tishman, [*Maker-Centered Learning: Empowering Young People to Shape Their Worlds.*](#)

MyWays Tools and the Mayan Worked Case Study

The MyWays Toolkit, available on the [Tools page](#) of the MyWays website, includes simple matrix tools to help you reflect and promote discussion on the MyWays concepts, and evaluate your existing experiential or project-based learning practices or design new ones.

The Toolkit also includes a worked case study that uses a selection of the MyWays evaluation tools to analyze a High Tech High middle school project on Mayan culture. The *Mayan worked case study* serves as:

- one example of the kind of Whole Learning and authentic learning design required to address the competencies needed for a world of acceleration
- a way of illustrating how you might use a few of the MyWays diagnostic/design tools with your educator and designer teams, and to build the will to transform among your fellow stakeholders



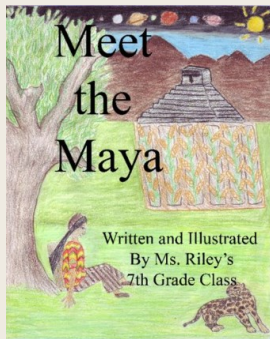
Three learning design tools from the MyWays Toolkit

We highlight here three of the MyWays learning-related tools. They are designed to help you use the seven principles of Whole Learning; the characteristics of junior versions; the four MyWays domains/20 MyWays competencies to address the third big question in the MyWays Through-line: *HOW can our learning experience design help students develop the broader, deeper competencies?*; and the Five Assessment Strategies to address the fourth big question in the MyWays Through-line: *HOW can our learning experience design help students develop the broader, deeper competencies?*

The first is the Whole Learning Analysis Tool. This tool helps you ask: How well do my projects reflect the principles of Whole Learning? **The second is the Junior Version Characteristics Tool.** This tool helps you ask: How well do my projects harness the benefits of junior versions? The third is the **Competency Correlation Tool.** This tool helps you ask: How well do my projects map to the MyWays competencies? These three tools are matrices to help you evaluate and improve assessment experiences. Simple, easy-to-follow instructions for using the tools are provided in the toolkit. You can also use the tool instructions to run a workshop, letting your teachers and educational designers team up to analyze the Mayan project prior to tackling one of your own projects.

The goal is to equip your learning design team with a reliable process for critiquing emerging authentic learning approaches — strengthening the extent to which you integrate student agency within your learning, moving the team toward more authentic and holistic tasks, while providing the relevant balance of challenge and supports for your students to make progress developing broader and deeper competencies. Even at a quick, conceptual level, these tools can flag key issues and “help change the conversation” within your team with respect to transforming learning design as a force for teachers to provide a more authentic experience for their students, as well as for learners to be able to reflect on their learning. You can also use the tool instructions to run a workshop, letting your teachers and educational designers team up to analyze the Mayan project prior to tackling one of your own projects.

Using the tools: High Tech High's Mayan Community Project



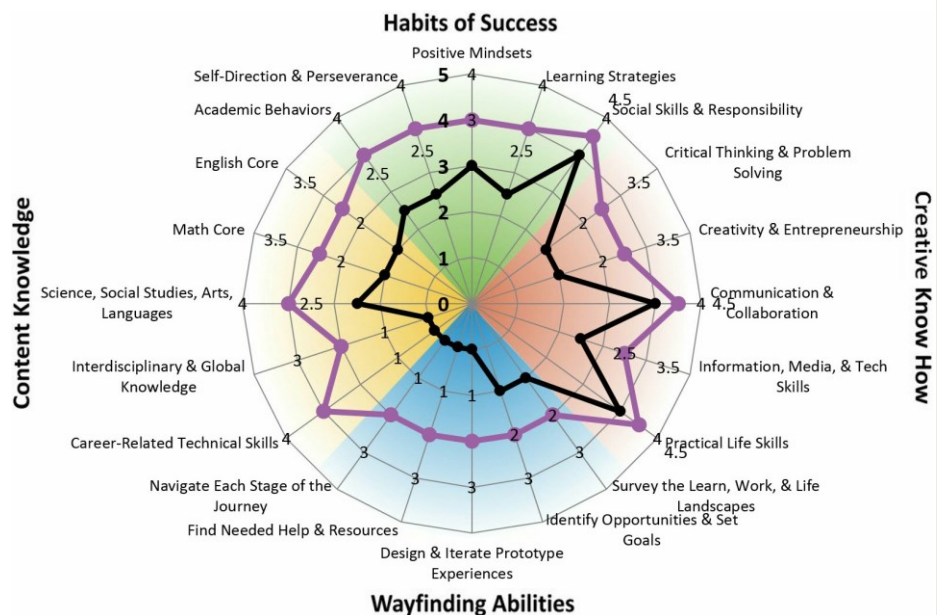
The Mayan Community Project is an experiential learning project developed by Heather (Riley) Lovell, a seventh grade teacher at a High Tech High middle school. We chose the project because Lovell and High Tech High offer an abundance of materials on the [High Tech High Project website](#) that let us share with you many different aspects of the experience that are relevant to the MyWays competencies and authentic assessment. And of course because the project provides an inspiring example of Whole Learning in a thoughtfully-design junior version! In Report 12 on assessment design, we extend the Mayan project analysis, using two assessment-related tools to demonstrate how you can align your assessment design with the two key assessment shifts and Five Assessment Strategies that are introduced in that report.

Potential tool for reflecting on whole-person competency goals

We have received positive, early responses to the MyWays Whole-Student Competency Plot — an idea we borrowed from the Lumina Foundation's Degree Qualification Profile. To enable educators to use the plot, we created two simple, publicly available tools in Excel that are easily customized and can be used to compare any two states, such as *student A vs. B*, *school A vs. B*, or, as in the example that follows, *today vs. future*. Two versions of the MyWays Whole-Student Competency Plot are available on the [MyWays website](#), along with a more detailed explanation. Currently, the tool is conceptual, but some members of the NGLC network are interested in using learning progressions, rubrics, and scoring protocols to make it empirically driven. For guidance on emerging tools of this sort, see the next resource box.

Tia's competency profile today (black) and goals at graduation (purple)

This plot illustrates a shortcoming that plays out almost every day in schools using the traditional, narrow academic metrics for student success. Tia (a fictionalized composite of two real students in the Boston area) is a complex learner whose natural gifts and competencies in Habits of Success and Creative Know How are neither recognized nor developed. Using a visual tool with a broader and deeper set of competencies enables Tia and her advocates to visualize her strengths and set goals for her future success.



Guidance on Finding Tools for Authentic Learning Design and Implementation

For tools relating to the design of project-based learning experiences, please see the organizations and links in the box titled “A Whole Learning Movement: High-Quality PBL” at the end of the section on learning design construct 1, Whole Learning, in this report. For quality standards and other guidance tools related to Whole Learning opportunities in real-world learning such as internships, service-learning, and see the organizations and links in the relevant zones described in the section on learning design construct 2, Wider Learning Ecosystem. The resource box just above also introduces you to some simple MyWays matrix tools designed to help you evaluate the characteristics of Whole Learning and junior version characteristics within your learning experiences, and to assess how well these experiences map to MyWays domains or competencies.

This box provides guidance on finding learning tools that help identify and support your work with, reflection on, and tracking of the MyWays competency domains within project-based and performance-based learning. These resources particularly focus on links, databases, or compendia for tools such as learning progressions, rubrics, and skills maps. Note that most of these can also be used for formative and performance assessment and are included in a similar resource box at the end of Report 12, *Assessment Design for Broader, Deeper Competencies*.

We know from our beta piloting work with next generation educators that those interested in and inspired by the MyWays Student Success Framework are also thirsty for these kinds of practitioner tools, exemplars, and documentation. In some cases, practitioners may be tempted to latch onto tools and use them without the internal mindset-changing and learning-model-revising work required for successful implementation; we caution against this! We also realize, however, that many thoughtful developers and practitioners want and need to see more concrete exemplars and tools to better understand the broader, deeper goal-line; to help work through their own approach; and to help plan and implement their assessment activities — which is why we provide these links. Note that MyWays and Next Generation Learning Challenges do not endorse any specific tools for assessment or curriculum planning — and particularly urge practitioners to ensure that tools they use are compatible with authentic, holistic learning.

Tools

- **The Institute for the Future of Learning’s open source tool repository**

As part of the Institute for the Future of Learning project (which produced the excellent report, [Assessing the Learning that Matters Most](#)), Julie Wilson created a database of learning progressions, rubrics, and tasks on the 4Cs and on self-assessment and social-emotional learning. The tools were provided by EL Education, New Tech Network, High Tech High, Mount Vernon, Two Rivers Public Charter School, Sanborn Regional School District in New Hampshire, Catalina Foothills, Science Research Academy, and KIPP Socratic Seminar — more than 75 documents in all. The tools are searchable by topic, school model, and grade level, and can be found on this [beta website](#).

- **EdLeader21’s 4C’s Rubrics**

This is a nationally vetted set of [rubrics](#) for the 4Cs from EdLeader21. The master set of 4Cs rubrics covers grades 3–4, 7–8, and 11–12 can be purchased from EdLeader21, but you can see adapted versions in links from this [blog](#) by Ken Kay, EdLeader21’s CEO, who noted that, “The rubrics are a great resource on their own, but you and your teachers can also adapt them to your needs. For example, some of our districts have [modified the rubrics](#) and [associated learning targets](#) to make them student-friendly.”

- **The Buck Institute rubrics for the 4Cs in a PBL context**

These [rubrics](#) describe what 4Cs good practice looks like, specifically in the project-based learning (PBL) context, with different sequenced rubrics for K–2, 3–5, and 6–12. Critical Thinking and the “Process”

section of Creativity & Innovation are organized by the four phases of a typical project. The Presentation Rubric is used only in a project's last phase, when students share their work with a public audience. Collaboration is relevant to all phases. See this [blog](#) for more on how to use these rubrics.

- **P21 21st Century Skills Maps**

These [21st Century Skills Maps](#) address how to implement learning models that integrate the 4Cs into core academic content mastery. 4Cs skills maps are available for math, science, social studies, geography, English, languages, and arts; ICT skills maps are available for social studies, English, and math. Each skills map provides examples of the types of skills that are appropriate for 4th, 8th, and 12th grade levels.

- **The Center for Innovation in Education (CIE) and Educational Policy Improvement Center (EPIC)'s Essential Skills and Dispositions Developmental Frameworks**

This [set of developmental frameworks](#) covers collaboration, communication, creativity, and self-direction in learning. The frameworks define five components inherent to each skill and describe performance for each component across a beginner to emerging expert progression, informed by research on the development of expertise. Unlike discipline-specific learning progressions and rubrics, the developmental progressions reflect components essential to the skill itself and describe growth dependent on many years of active exploration, experimentation, setbacks, and reflection.

- **New Tech Network's learning outcomes, rubrics, and college-ready assessments**

New Tech Network (NTN), working with Envision and the Stanford Center for Assessment, Learning, and Equity (SCALE), created [open-source learning outcomes and rubrics](#) related to: knowledge and thinking in different core subject areas; agency; collaboration; and oral and written communication. These tools are used in NTN's curriculum-embedded performance assessments called [College Readiness Assessments](#). The network also offers a three-part Student Literacy [video series](#) (10–15m each) that guides users through the delivery of workshops focused on the creation of high-quality tasks, looking at student work, and the use of the knowledge and thinking rubrics (including the difference between grading and scoring).

- **Two Rivers Public Charter School's resources**

Two Rivers Public Charter School, a high-performing [EL Education School](#), hosts its own excellent professional sharing site, [Learn with Two Rivers](#). Its tasks and rubrics that address critical thinking, problem solving/"expert thinking," collaboration, and communication are currently being curated in this separate [Deeper Learning Assessment folder](#). For a public share of excellent resources on working with Habits of Success (Valor's Compass program) by this thoughtful MyWays Community of Practice member, see links to over a dozen resources in their ["Working the Compass" Resource Guide, Summer 2017](#).

Endnotes for Report 11

¹ Robert Halpern, *Youth, Education, and the Role of Society: Rethinking Learning in the High School Years*, Harvard Education Press, 2013, p. 6.

² Education Reimagined, *A transformational vision for education in the US*, 2015, p. 2.

³ Ibid. For more on the five elements, see also Education Reimagined, *Practitioner's Lexicon: What is meant by key terminology*, 2017.

⁴ For more on the range of frameworks, see this series' *Introduction and Overview*, where we discuss the main offerings from the fields of education, human/youth development, and work.

⁵ Jean Lave and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, 1991.

⁶ David Perkins, *Making Learning Whole: Seven Principles of Teaching Can Transform Education*, Jossey-Bass, 2010.

⁷ Ibid., p. 61.

⁸ Ibid.

⁹ Ibid., p. 215.

¹⁰ Jal Mehta, "[Schools Already Have Good Learning, Just Not Where You Think](#)," Learning Deeply blog, *EdWeek*, February 8, 2017.

¹¹ Perkins, *Making Learning Whole*, p. 2.

¹² Ibid., p. 20. We determined, in beta-testing the use of Perkins' principles over the past few years that some educators found the strong "game" analogy useful, while many others found it off-putting or felt that it distanced them from the educational parallels.

¹³ Next Generation Learning Challenges, "[Next Gen Learning — Student Perspective](#)," undated; Hewlett "[Deeper Learning Competencies — Six Powerful Strategies](#)," 2013; "Big Picture Schools Student Expectations" in Elliot Washor and Charles Mojkowski, *Leaving to Learn: How Out-of-School Learning Increases Student Engagement and Reduces Dropout Rates*, Heinemann, 2013, p. 121; Linked Learning in *Behaviors of Learning and Teaching*, ConnectEd, 2014; and The Buck Institute, "[Gold Standard PBL: Essential Project Design Elements](#)," 2014. See more on these and other frameworks in this series' *Introduction and Overview*.

¹⁴ Perkins, *Making Learning Whole*, p. 40.

¹⁵ Tom Vander Ark, "[What's Next? Personalized, Project-Based Learning](#)," *Getting Smart* blog, May 18, 2016.

¹⁶ Thomas Markum, "[How PBL Educates the Whole Child](#)," *Edgeucation* blog, August, 29, 2016.

¹⁷ The campaign is also being aided by an advisory team — a diverse collection of 90 thinkers, leaders, and practitioners helping to shape the HQPBL Framework; the team includes Ron Berger (the Chief Academic Officer of [EL Education](#)), Tony Wagner (author of [Creating Innovators](#)), Yong Zhao ([professor and celebrated author](#)), and Chuck Cadle (the CEO of [Destination Imagination](#)).

¹⁸ Robert Halpern, *It Takes a Whole Society*, The Nellie Mae Education Foundation, 2012, p. 3.

¹⁹ Robert Halpern, *Youth, Education, and the Role of Society*, Harvard Education Press, 2013, p. 39.

²⁰ 2Revolutions, *Designing the Future of Learning: Unthink school to rethink learning*, 2012.

²¹ Elliot Washor and Charles Mojkowski, *Leaving to Learn: How out-of-school learning increases student engagement and reduces dropout rates*, Heinemann, 2013, p. xxvii.

²² Michele Cahill, in foreword to Tom Vander Ark and Mary Ryerse, *Smart Cities That Work for Everyone: 7 Keys to Education & Employment*, Getting Smart, 2015, p. 17.

²³ Ibid., p. 16.

-
- ²⁴ Douglas Thomas and John Seely Brown, *A New Culture of Learning: Cultivating the Imagination for a World of Constant Change*, CreateSpace Publishing, 2011, as quoted in The Aspen Institute's *Learner at the Center of a Networked World*, 2014, p. 27.
- ²⁵ Derek Thompson, "[The Thing Employers Look For When Hiring Recent Graduates](#)," *The Atlantic*, Aug 19, 2014.
- ²⁶ Thomas and Seely Brown, *A New Culture of Learning*, p. 17.
- ²⁷ *ExpandED Schools: Developing Mindsets to Support Academic Success*, research brief, Policy Studies Associates, March 2014.
- ²⁸ See [Educurious](#) and Generation Schools Network, *Linking Learning to Life: How Expanded Learning Time Creates the Opportunity for College and Career Readiness Programming*, 2014, p. 1.
- ²⁹ Quoted in Katrina Schwartz, "[The Value of Internships: A Dose of the Real World in High School](#)," *Mind/Shift*, March 7, 2014.
- ³⁰ Schwartz, "[The Value of Internships](#)."
- ³¹ Mihaly Csikszentmihalyi and Barbara Schneider, *Becoming Adult: How Teenagers Prepare for the World of Work*, Basic Books, 2001, p. 19.
- ³² Alia Wong, "The Activity Gap," *The Atlantic*, January 30, 2015. Some data suggests that involvement in extracurricular activities is just as meaningful as test scores when it comes to subsequent educational attainment and accumulated earnings later in life. See also Robert Putnam, *Our Kids: The American Dream in Crisis*, Simon & Schuster, 2015, pp. 174–183; and Kaisa Snellman, Jennifer M. Silva, and Robert Putnam, "[Inequity Outside the Classroom: Growing Class Differences in Participation in Extracurricular Activities](#)," *Voices in Urban Education*, 40.
- ³³ Claire Cain Miller, "[Class Differences in Child-Rearing Are on the Rise](#)," *The New York Times*, December 17, 2015. Extracurricular activities epitomize the differences in child rearing in the Pew survey of a nationally representative sample of 1,807 parents. Of families earning more than \$75,000 a year, 84% say their children have participated in organized sports over the past year, 64% have done volunteer work, and 62% have taken lessons in music, dance, or art; of families earning less than \$30,000, 59% of children have done sports, 37% have volunteered, and 41% have taken arts classes.
- ³⁵ Michele Cahill, in foreword to *Smart Cities*, p. 17, and in the EdWeek blog, "[Leadership for Education Innovation](#)."
- ³⁵ Jenny Nagaoka, Camille A. Farrington, Stacy B. Ehrlich, and Ryan D. Heath, *Foundations for Young Adult Success: A Developmental Framework*, UChicago Consortium for School Research, 2015, p. 7.
- ³⁶ Washor and Mojkowski, *Leaving to Learn*, p. 88.
- ³⁷ Education Reimagined's *Practitioner's Lexicon*, pp. 8–9; National Society for Experiential Education's *Eight Principles of Good Practice for All Experiential Learning Activities*; and the Association for Experiential Education's (12) *Principles of Experiential Education Practice*.
- ³⁸ Washor and Mojkowski, *Leaving to Learn*, p. xxvii.
- ³⁹ From the [Hive Learning Networks](#).
- ⁴⁰ See, for example, the partnerships described in Jobs for the Future's *Co-Design, Co-Delivery, and Co-Validation: Creating High School and College Partnerships to Increase Post-Secondary Success*, 2015.
- ⁴¹ See, for example, [JMG](#), a nonprofit that partners with schools in Maine to offer career-related services, including shadow programs, mentorships, and internships.
- ⁴² For partnerships with companies (including speakers coming into schools and teacher externships), internships, and shadow programs, see Jessica Juliuson's American Youth Policy blog, "[Keeping It Real: Building Bridges Between Employers and Schools](#)." Vander Ark and Ryerse's *Smart Cities* provides a list of 10 partnership strategies to boost student employability (pp. 151–153), while KnowledgeWorks offers [six lessons](#) from the most successful partnerships in their network, along with [six ways to maximize your partnerships](#).
- ⁴³ See more about collective impact in Report 4 of this series, which summarizes John Kania and Mark Kramer's five key elements of successful collective impact: *common agenda, shared measurement systems, mutually reinforcing activities, continuous communications*, and a *backbone organization*. In Vander Ark and Ryerse's *Smart Cities*, the authors dedicate a chapter to chronicling how schools and education organizations are using collective impact to partner with other organizations to improve both academic and employment outcomes for students.
- ⁴⁴ [Remake Learning](#) in Pittsburgh.
- ⁴⁵ Chris Sturgis, "[Pushing the Envelope with Student Centered Learning at VLACS](#)," CompetencyWorks, April 14, 2015.

⁴⁶ For more on VLACS, see its [website](#), as well as two CompetencyWorks blogs: Chris Sturgis, “[Pushing the Envelope](#),” April 14, 2015, and Sarah Luchs, “[Competency Moves Beyond Courses](#),” September 16, 2013.

⁴⁷ Michele Cahill, “[Leadership for Education Innovation](#),” blog, Getting Smart, May 24, 2014.

⁴⁸ “Internships drive all learning, which involves students being offsite two days a week, having a wide range of learning experiences across the City. Offsite is almost more important than onsite activity. Assessment is holistic and industry/third sector/community partners co-construct the assessment rubrics, so their standards and expectations become part of the school operating system and culture.... The process for how students acquire internships is brilliant in scaffolding and building their relationships with the wider community, and internships are seen as very much an academic experience, reframing the academic/vocational value divide which is very powerful. Relationships are horizontal, with learning being facilitated by a wide variety of adults and mentors.” Rosie Clayton, “[Personalization and Real-World Learning at Big Picture Schools](#),” blog, Getting Smart, October 28, 2016.

⁴⁹ Quoted by Larry Ferlazzo in “[Response: Leveraging Field Trips to ‘Deepen learning’](#),” Classroom Q&A blog, EdWeek, December 12, 2016.

⁵⁰ New Hampshire Department of Education, “[Extended Opportunities](#)” [web page](#).

⁵¹ In addition to the forthcoming WLE resource, see more on crediting work outside the classroom, badging, assessment of prior learning, stackable credentials, broader transcripts, and other related topics in other reports in the current *MyWays Student Success Series*, especially: Report 3, within descriptions of work/learn landscape components and issues; Report 10, in links to career pathways and career development; and in Report 12, in sections on the fourth of the Five Assessment Strategies: Badging & micro-credentials. For parallel efforts in the European Union, see [Recognition of youth work and of non-formal and informal learning within youth work Current European developments](#), Salto-Youth Training and Cooperation Resource Centre, April 2016.

⁵² Washor and Mojkowski, [Leaving to Learn](#), p. 110.

⁵³ Katherine Price, Andrea Saveri, and Jason Swanson, [Exploring the Future Education Workforce: New Roles for an Expanding Learning Ecosystem](#), KnowledgeWorks, 2015; KnowledgeWorks, [2020 Forecast: Creating the Future of Learning](#), 2008, with future educator role [dossiers and videos](#); and other related KnowledgeWorks publications.

⁵⁴ Extracurriculars, Mehta argues, have “an entirely different grammar,” as junior versions of recognized and valued adult activities from which they inherit “thick infrastructures” of meaning and expectation; see Jal Mehta, “[Schools Already Have Good Learning. Just Not Where You Think](#),” Learning Deeply blog, EdWeek, February 8, 2017.

⁵⁵ Putnam, [Our Kids](#), pp. 174–183.

⁵⁶ “[A summer job makes a difference in classroom learning, Stanford scholar says](#),” *Stanford News*, September 1, 2015; [Worrying declines in teen and young adult employment](#), Brookings report, December 16, 2015, quoting research from the National Research Council, academic, and government studies, and Robert Halpern.

⁵⁷ “[Here’s How Home Schooling Is Changing in America](#),” *US News and World Report*, September 12, 2016.

⁵⁸ Quoted in Mariale Hardiman, [The Brain-Targeted Teaching Model for 21st-Century Schools](#), 2012, p. 95.

⁵⁹ Gert Biesta and Michael Tedder, [How is Agency Possible?](#) Learning Lives, February 2006, p. 10.

⁶⁰ Peter Brown, Henry L. Roediger III, and Mark A. McDaniel, [Make It Stick: The Science of Learning](#), Harvard University Press, 2014, p. 102.

⁶¹ Robert Halpern, [Youth, Education, and the Role of Society](#), Harvard Education Press, 2013; Laurence Steinberg, [The Age of Opportunity: Lessons from the New Science of Adolescence](#), Eamon Dolan/Mariner Books, 2015; and Daniel J. Siegel, [Brainstorm: The Power and Purpose of the Teenage Brain](#), TarcherPerigee, 2014.

⁶² Brown, Roediger, and McDaniel, [Make it Stick](#), p. 18. For related information, see the discussion of “high-leverage concepts” and application of knowledge in Report 9, *Content Knowledge — for the Life Students Will Lead*.

⁶³ *Ibid.*, pages 12 and 20.

⁶⁴ *Ibid.*, p. 47.

⁶⁵ *Ibid.*, p. 49.

⁶⁶ *Ibid.*, p. 50.

⁶⁷ *Ibid.*, p. 56.

⁶⁸ *Ibid.*, p. 72.

⁶⁹ *Ibid.*, p. 75.

⁷⁰ Ibid., p. 68.

⁷¹ Ibid., p. 74.

⁷² The terms *cognitive apprenticeship*, *situated learning*, and *legitimate peripheral participation* all derive from Lave, *Situated Learning*.

⁷³ Dennen and Burner (see next endnote) refer to modeling, coaching, reflection, articulation, and exploration. We have simplified the list to modeling, conversing, and coaching. Any of these three actions may incorporate forms of scaffolding (temporary supports).

⁷⁴ Dennen and Burner, "[The Cognitive Apprenticeship Model](#)," p. 427.

⁷⁵ Allan Collins, Ann Holum, and John Seely Brown, "[Cognitive Apprenticeship: Making Thinking Visible](#)," originally appeared in the Winter 1991 issue of *American Educator*, the journal of The American Federation of Teachers, and is reprinted on the 21st Century Learning Initiative's website with permission.

⁷⁶ In Lev Vygotsky's concept of the zone of proximal development, "more knowledgeable others" are those whose presence enable a higher level of development; see Lev Vygotsky, [Mind in Society: The Development of Higher Psychological Processes](#), Harvard University Press, 1978, p. 86.

⁷⁷ Dennen and Burner, "[The Cognitive Apprenticeship Model](#)," p. 427; and Collins, Holum, and Brown, "[Cognitive Apprenticeship: Making Thinking Visible](#)."

⁷⁸ John Seely Brown and Paul Duguid, "[Organizational Learning and Communities-of-Practice: Towards a Unified View of Working, Learning, and Innovation](#)," *Organization Science*, vol. 2, no. 1, 1991, p. 40–57.

⁷⁹ Robert Halpern, [Youth, Education, and the Role of Society](#), p. 7.

⁸⁰ Robert Halpern, [The Means to Grow Up: Reinventing Apprenticeship as a Developmental Support in Adolescence](#), 2009, p. 180.

⁸¹ Scott Berinato, "[Success Gets in Your Head and Changes It](#)," *Harvard Business Review*, January-February 2008.

⁸² Halpern, [Youth, Education, and the Role of Society](#), p. 25.

⁸³ Forum for Youth Investment, [Preparing Youth to Thrive](#), 2016.

⁸⁴ Brown, Roediger, and McDaniel, [Make It Stick](#), p. 102.

⁸⁵ John Taylor Gatto, [Dumbing us Down: The Hidden Curriculum of Compulsory Schooling](#), 2nd edition, New Society Publishers, 2002.

⁸⁶ Roberto Rivera, "[Hip-hop\(e\)](#)," TEDxGrandRapids, June 16, 2014.

⁸⁷ Jenny Nagaoka and others, Foundations of Young Adult Success, UChicago Consortium on School Research, 2015, unnumbered page following Contents and page 39.

⁸⁸ [Make It Stick](#), p. 66 and Betty Garner, *Getting to "Got It!"*, 2007, p. xv.

⁸⁹ Forum for Youth Development, [Preparing Youth to Thrive](#), 2016, p. 18.

⁹⁰ Robert Halpern, [Youth, Education, and the Role of Society](#), p. 6. Internal quote is Mark Pagel, *Wired for Culture: Origins of the Human Social Mind*, 2012.

⁹¹ Robert Epstein, [Teen 2.0: Saving Our Children and Families from the Torment of Adolescence](#), 2010.

⁹² Robert Halpern, [It Takes a Whole Society: Opening Up the Learning Landscape in the High School Years](#), 2012.

⁹³ Nikola Tesla as quoted in Sylvia Libow Martinez and Gary Stager, [Invent to Learn: Making: Tinkering, and Engineering in the Classroom](#), 2013, p. 11.

⁹⁴ Agency by Design [Educator Resources](#) webpage, retrieved September 2, 2017.

⁹⁵ Reed Larson, "[Positive Development in a Disorderly World](#)," *Journal of Research on Adolescence*, vol. 21, no. 2, June 2011, p. 317–334.

⁹⁶ Martinez and Stager, [Invent to Learn](#), p. 83.

⁹⁷ Ibid., p. 25.

⁹⁸ Edward P. Clapp, Jessica Ross, Jennifer O. Ryan, and Shari Tishman, [Maker-Centered Learning: Empowering Young People to Shape Their Worlds](#), Jossey Bass, 2016, p. 95.

⁹⁹ Marvin Minsky, [The Society of Mind](#), 1988.