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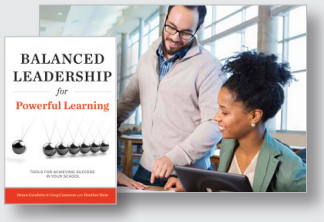

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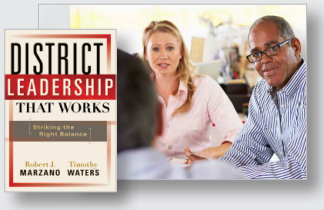

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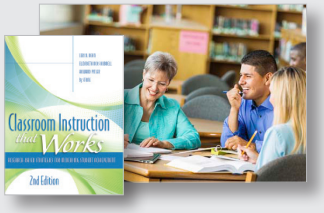

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In this issue

Reimagining school reform

As we close the book on No Child Left Behind (NCLB) and open a new chapter with the Every Student Succeeds Act (ESSA), educators are reflecting on what we've learned about school reform in the last decade. While NCLB helped put more focus on the importance of data, research-based practices, and the needs of subgroups of students, it has also taught us plenty about what *doesn't* help all students succeed: high-stakes testing and accountability, one-size-fits-all solutions, external pressures, and extrinsic rewards.

So where do we go from here? As McREL President and CEO Bryan Goodwin explained in our recent white paper, *The Road Less Traveled: Changing Schools from the Inside Out* (2015), states and districts have spent countless resources, hours, and energy on creating a complex, top-down system of reform while neglecting to stop and think about those closest to learning—students and teachers—and what drives them to perform better.

As any student or teacher will tell you, you can't *force* anybody to learn better or to teach better; they have to want to do it for themselves. Though this may sound obvious, it's not something that we've ever tried to build our educational system on. The key, Goodwin says, is approaching school improvement from the inside out—putting the engagement, motivation, and curiosity of students and teachers at the center of everything schools do.

This has sweeping implications, of course—for leadership, professional learning, assessment, curriculum and instruction, and the cultures and climates of our schools. In this issue of *Changing Schools*, we take a look at what an inside-out perspective means for each of these areas, keeping in mind that this is but a starting point as educators begin opening their minds to the possibilities of a new, more engaging system of schooling.

To read McREL's white paper, visit http://www.mcrel.org/the-road-less-traveled/.

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CONTENTS

ESSA offers an unprecedented fresh start for school and systems improvement

By Dale Lewis and Matt Seebaum

Last December, when President Obama reauthorized the Elementary and Secondary Education Act (ESEA) by signing the bipartisan Every Student Succeeds Act (ESSA), a seismic shift in school reform occurred—one that offers an unprecedented opportunity for education leaders across the country to rethink how they approach school and district improvement.

As we transition away from the top-down, prescribed compliance of the No Child Left Behind era, ESSA promises increased autonomy for education leaders to effect change where it has the greatest impact: in states and school districts. Now is the time for leaders at the state, district, and school levels to pause and reflect on how effective their own systems have been—and could be—in supporting teaching and learning that truly improves student achievement.

A look back: Reform from the outside in

For more than 30 years, a top-down, or "outside in," perspective on school improvement has been the norm in the United States (see infographic on p. 10). This perspective puts those who are *farthest* from the learning context in charge of policy and procedure, especially for schools and systems in need of the greatest improvement (e.g., "turnaround" schools). The resulting one-size-fits-most approaches dictate strict adherence to structures, processes, and programs, with little or no input from stakeholders, and are often imposed from external sources.

We now know that, though the intention of such approaches was to "raise up" all learners, results have been, at best, mixed. Research has shown that outside-in structures seem to have led to minimal student performance gains initially—which eventually plateau. One interpretation of this effect is the lack of local buy-in or contextual "fit" to such initiatives. In short, we can say that it remains unproven whether standards and test-driven accountability have had any effect on student achievement or on improving the quality of instruction among classroom teachers.

One thing we know for sure is that outside-in approaches have had major implications for leaders of schools and school districts, significantly limiting—and in some cases, removing—local governance, context, and input from the equation. There has been much debate as to whether education and schooling is a function of the states or of a larger national system that dictates policy for state departments of education and school districts everywhere. With ESSA on the horizon, we should ask ourselves: What is it we have learned from the past? What has been good about NCLB? What has been bad? What should we do differently?

A look forward: Reform from the inside out

Under ESSA, accountability systems have been expanded to include new measures of student success, which allow for the consideration of long-disregarded factors such as student and educator engagement. This new definition sets the stage for a whole new paradigm for states, schools, and school systems that is based on growing student achievement by attending to what's happening *inside* the classroom to nurture engagement and motivation. Thus, we call this the *inside-out approach*.

To support inside-out improvement, system leaders must concentrate on improving learning for the group that has the greatest school-based influence on student achievement:

classroom teachers. For some, this makes perfect sense and has likely always been their mode of operation, but in many instances, this shift brings major implications.

Most educators today agree that, in order to prepare students for a future that is often undefined, we must focus on developing skills that are universal for life and career success and that current and future employers demand, including those related to leadership, communication, teamwork, and problem solving (Adams, 2014). But first, we have to make sure teachers understand these skills. Do schools and school districts provide opportunities for teachers to learn about these skills and, further, to put them into practice themselves?

Ultimately, it is the steps that school and system leaders take to strengthen teaching and learning that define an inside-out approach to improvement. An approach to professional learning that helps teachers own and rethink their practice in authentic, applied ways is key to moving a system toward *sustainable, self-perpetuating* excellence that cannot be attained in systems relying primarily on external control and direction (Fullan, 2012).

Slowing down the pendulum with defined autonomy

Over the years, education has taught us that too much of anything is potentially harmful—what we often refer to as "the pendulum effect." One side of this metaphorical pendulum may be rigid, top-down, outside-in accountability mandates; on the other side may be the site-based management (SBM) movement of the 1980s and 1990s, characterized by decentralized authority, facilitative school-level leadership, and loose parameters as to what schools should focus on to assure student success. In both cases, the effects have been varied and failed to live up to expectations. We should know by now that there are no quick fixes to the challenges that school systems face.

So how do we combat this tendency towards extremes in education? How can school systems provide the right amount of support or autonomy for individual schools? One powerful construct for system-level leaders to consider is *defined autonomy*. This was the most surprising finding in Waters and Marzano's meta-analysis on behaviors of district-level leaders linked to increased student achievement (2009). They discovered that most effective principals "set clear, non-negotiable goals for learning and instruction, yet provide school leadership teams with the responsibility and authority for determining how to meet those goals" (p. 4).

Defined autonomy means that system-level leaders must differentiate their leadership based on the needs of their schools and principals. For instance, within a typical mid-sized district, schools have varying performance levels and needs. Low-performing schools, for example, may need intensive interventions, resources, direction, and support. On the other hand, high-performing schools may only require executive direction related to performance targets. These differing needs require system leaders to look at individual schools from the inside out.

To support inside-out improvement, system leaders must concentrate on improving learning for the group that has the greatest school-based influence on student achievement: classroom teachers.

It's in our hands

The inside-out approach offers school systems a fresh pathway to improvement that puts student and teacher engagement, curiosity, and motivation at the center of learning and makes systemic change relevant to those whom it most affects. As we enter a new era of expanded accountability with ESSA, we have a unique opportunity to use what we have learned to shape our schools and districts into those which all of our students deserve: ones that prepare them, from within, for lifelong learning and success.

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Professional learning from the inside out: *Putting teacher curiosity first*

By Kristin Rouleau and Bess Scott

How do teachers in your school respond to professional learning? Are they running into the sessions with enthusiasm and wonder? Do they leave with knowledge, understanding, skills, and renewed energy that they immediately apply in their classrooms? If your answers are "no," you're not alone. Despite great improvements in professional learning in recent years—we know more now than we ever have about how adults and students learn—many teachers still are not engaged in their own growth and learning. Why?

For many years, under No Child Left Behind, teachers have received mostly top-down, compliance-driven professional learning that has very little, if anything, to do with their own teaching or students. Not only that, but the results have been less than inspiring. Research has shown that, while some schools had initial gains in achievement, those gains went on to plateau or decline after about three years (Nichols, Glass, & Berliner, 2012).

Researchers like Karin Chenoweth, however, found that some low-performing schools have been able to rise above performance plateaus when they allow teachers and leaders to *adapt* prescribed changes to their individual schools' needs (2007). In these schools, intense technical and prescriptive changes were often necessary to reduce the variability in curriculum and instruction and provide a foundation upon which skilled and knowledgeable teachers can then make adjustments. This complex adaptation flourished in embedded professional development that began inside classrooms and among collaborative teams, such as professional learning communities, grade-level teams, and departments, in response to *teachers' own questions* about how to get better.

Teacher engagement in and curiosity about their own learning is at the heart of an inside-out approach to professional learning. If your school has reached a performance plateau and professional learning isn't making a difference, this approach will help "unstick" teachers and bolster their capacity—and desire—to meet their own learning needs and those of their students.

Ready for a new approach

For some, the idea of teacher-led learning may evoke images of unfocused, "flavor of the day" working sessions that don't necessarily support learning goals or standards; don't lead to systematic, systemic, or sustainable improvements; and leave teachers even more "stuck" and overwhelmed.

However, *effective* inside-out professional learning has the opposite effects—if it's happening in a school environment where everyone is focused on student achievement and continuous improvement, the learning is aligned to school and district goals and, perhaps most important, the school leader understands his or her role in supporting teachers.

McREL's research has shown that, regardless of where your school is on the improvement continuum, effective leadership means knowing when and how to step up and step back or, in other words, how to balance a more *directive* leadership style with a more *empowering* one (Goodwin, Cameron, & Hein, 2015). When schools are starting with the basics and need to implement straightforward technical solutions to the challenges they face, principals need to be more directive. However, as teachers are able to create a solid foundation and tackle more adaptive challenges, principals need to become more empowering—allowing teachers to take what they've learned and make it work for them and their students.

If done right, an inside-out approach systematizes this kind of adaptation and leverages the best thinking and teaching practices across your school. So where to begin?

Changing teacher learning one step at a time

As with any change or initiative a school undertakes, implementation is key to success. Because curiosity tends to be spontaneous and individualized, it's even more important for implementation of inside-out professional learning to be focused and structured and for the school leader to be confident in the new approach.

1

Step one is for you and your administrative team to educate yourselves about the current state of teacher learning in your school. Start with a quick, non-scientific, environmental scan of all teacher learning that occurs in the school. Unleash your own curiosity and the curiosity of your team about teacher development and support with these simple yes/no questions:

- Do teachers come into learning sessions full of enthusiasm and wonder?
- Do they learn collaboratively in their professional learning communities?
- Do teachers improve daily through self-reflection, peer observations, or instructional coach interactions?
- Do they leave each learning opportunity with knowledge, understanding, skills, and renewed energy that are immediately applied?

2

Then, dig deeper by asking, "Why?" for each of these questions until you uncover the root cause for each "yes" or "no." Use your "whys" to identify your school's strengths, or "bright spots." Engage teachers in similar small-group conversations to learn and understand their perspectives about teacher learning compared to the administrative team's perspective.

The inside-out approach in action: *Peer coaching*

After analyzing school data and much reading and discussion, teachers at my school identified classroom practice as the most important factor in progressing the academic growth of every student. To improve classroom practice, we planned and implemented a series of ongoing classroom observations including all teachers in the school. They started off as informal observations, allowing staff to get used to having another teacher in the room, and progressed to a more formal structure with documentation and feedback, which was used in coaching discussions. Eventually, we added 20-minute "drop-ins" by members of the leadership team, which included leaders chatting with individual students about what was changing or getting better in their classroom.

After three, 11-week cycles, the leadership team noticed something exciting happening: A number of motivated, influential teachers were spending their own planning time in others' classrooms outside of the scheduled observations—a clear indication of the value that teachers placed on the process. Teachers were independently working in cross-level partnerships and triads, talking about teaching and learning during breaks, and offering to help others develop their practice. Reflecting on practice became a natural process for everyone and teachers connected with colleagues who could help them most in the areas they wanted to improve.

Four years after its conception, the program remains relevant and in place, with overall student outcomes data trending steadily upward over time. Teacher curiosity and an intrinsic desire to improve has allowed the program to evolve along with teacher needs, ensuring its relevancy and sustainability into the future.

Tonia Gibson
Former Assistant Principal,
Greenhills Primary School
Melbourne, Australia

3 Next, determine your starting point by focusing on your school's bright spots. Consider whether you'll start the inside-out approach with a small group (e.g., a curricular department or PLC), or if you'll begin with a practice the whole staff is implementing. Start small, choosing a bright spot that is connected to the goals of your school, including teacher goals, PLC goals, and continuous improvement goals. Starting small increases the probability of learning by doing, replication, growth, and sustainability.

Putting it into action

Now you're ready to practice with your teachers. The actions below are based on those for an inside-out approach to reform outlined in McREL's 2015 white paper, *The Road Less Traveled: Changing Schools from the Inside Out,* considered from a professional learning perspective. You may have some of these elements already in place and, therefore, they are not necessarily sequential—what's important is that you're nurturing these elements and refocusing your school on the importance of engaging and motivating teachers and learners.

Create a shared purpose. Get everyone on the same page by coming back to and celebrating fundamental beliefs about teaching—that every teacher wants to excite and engage their students and transform their learning through their instruction. Help teachers articulate this "moral purpose" and connect it to the "why" of their continuous professional learning. Creating a shared purpose and relating it to teachers' goals and mission builds coherence and relevance, necessary components of effective professional learning (Patton, Parker, & Tannehill, 2015).

Unleash teacher curiosity and engagement. What could be more relevant than teachers' thoughts about themselves, their practices, and their own students? Engage teachers in an inquiry process to self-assess their learning needs. Spark curiosity by asking intentional questions, such as:

- What makes you curious about students who are excited, engaged, and learning at high levels?
- What makes you curious about students who are not excited, engaged, and learning at high levels?
- When your team looked at the most recent data, what made you wonder?
- What excites you as a teacher? Why?
- What engages you in your own learning? Why?
- What if we...?

Build on bright spots. Help teachers identify what makes their bright spots work, recognizing practices that maximize student learning. Provide teachers with opportunities to observe one another's bright spots. Ask how continuous teacher learning might make their strengths even stronger. Best practice in professional learning links effective instructional strategies with content (Patton, Parker, & Tannehill, 2015); bright spots *are* this link in action.

> If your school has reached a performance plateau and professional learning isn't making a difference, [an inside-out] approach will help "unstick" teachers and bolster their capacity. . . to meet their own learning needs and those of their students.

Lead with questions. Lead your teachers with a spirit of inquiry to help teachers focus their professional learning. Choose someone to act as a "recorder" to compile ideas, which sends the message that curiosity is valued and affirms their capacity to find answers through collective inquiry. Use clarifying and probing questions to help the team identify ways to make a bright spot even stronger. Collective inquiry promotes the building of a community of learning (Birman, Desimone, Porter, & Garet, 2000) and helps teachers find novel approaches to classroom challenges.

Adopt and adapt in rapid cycles. Help teachers translate what they're learning into a rapid-improvement cycle—testing and improving new approaches based on data they collect and the mistakes they find. Create a trusting environment where such "adopt and adapt" cycles are the way teachers learn every day. Push and support teachers to find, test, improve on, and learn from their solutions in response to individual and collective wonderings.

Support change with peer coaching. Peer coaching makes the learning process social and sets in motion a recursive process that allows for ongoing, sustained professional learning, two features of effective professional learning (Patton, Parker, & Tannehill, 2015). Peer coaching can be carried out in different ways; Joyce, Hopkins, and Calhoun (2014), for example, suggest that it's most effective for duos or triads of teachers to take what they learn through a rapid-improvement cycle, apply it in their classrooms, observe it in each other's classrooms to study how students respond, and collaboratively provide feedback to improve their practice. Another approach is instructional rounds, a Harvard-developed protocol modeled after the medical rounds that doctors conduct, consisting of systematic classroom observations by teams of colleagues.

Reframe the goal. Top-down, accountability-driven student assessments are not a timely, useful measure for a rapid-improvement cycle, nor do they accurately measure the power of inside-out professional learning. Rather, use the

data collected in the rapid-improvement cycle to measure depth of teacher implementation and student impact. Data collected through peer coaching duos or triads and analysis of student work samples show which instructional practices have promise for increasing student learning and are sustainable.

Why not?

If your school has been doing professional learning one way for a long time, shifting to an inside-out approach may seem daunting. What if teachers don't want to change? Do we really have the time and energy to change how we do things? What if we make the shift but don't see any real benefits?

However, when you look at the past nearly 30 years of top-down, test-driven accountability and where it's gotten us in terms of teacher and student learning, the real question is, *why not*? If you are committed to improving student achievement, understand your role in supporting teachers and managing change, and implement the actions we've suggested with fidelity, imagine how a school full of curious, engaged teachers and students would help you reach your goals.

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Changing schools from the inside out: A NEW APPROACH

In *The Road Less Traveled: Changing Schools from the Inside Out*, McREL President and CEO Bryan Goodwin shows how the past three decades of top-down, "outside-in" education reform have done very little, if anything, to improve student outcomes. Might there be a better way?

McREL's inside-out approach puts the engagement and curiosity of students and teachers at the center of everything that schools do, creating more powerful, longer lasting outcomes for performance and achievement.

School reform from the OUTSIDE IN

1. Starting with the glass half empty
Outside-in approaches often begin with deficit thinking—identifying gaps and assuming that the answers are found outside the system.

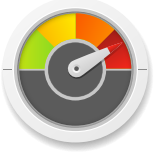
2. Scripting one-size-fits all solutions
External solutions often consist of approaches that educators are expected to adopt regardless of the local context.

3. Giving orders
The default leadership behavior is to force teachers into adopting an approach, with little time or latitude for questioning or adapting approaches if they appear to be counterproductive.

4. Relying on summative measures
High-stakes annual testing and other summative measures drive performance, with data often coming too late to do anything about them.

5. Using coaching to ensure compliance
Administrators view peer collaboration and coaching as top-down approaches, turning teacher coaches into confederates of the central office tasked with ensuring proper compliance with the scripted program.

6. Employing extrinsic rewarding and punishments
The default motivational tool is often "carrots and sticks"—sanctions for poor performance or rewards for good performance—despite research showing that extrinsic rewards tend to have diminishing returns over time.



7. Maintaining pressure
Frustrated by diminishing returns, administrators often feel the need to turn up the heat, so to speak, even though a growing body of research shows creating threat conditions actually diminishes performance.

School reform from the INSIDE OUT

1 *Develop shared understanding about the moral purpose of schooling*

System leaders engage their communities, teachers, and elected officials in a collaborative dialogue that answers the question: Why do our schools exist?

2 *Put curiosity, engagement, and motivation at the center of schooling*

Ease the burden of student success by helping teachers understand how to tap into students' natural curiosity to create motivated, lifelong learners.

3 *Build on bright spots and strengths*

Intrinsic motivation is a powerful motivator for both students and adults. Help teachers look for and build on bright spots in their current practice and use performance appraisal to support (not sort) teachers.

4 *Develop leaders as change agents and questioners*

Schools today face complex, adaptive challenges—and principals must be able to share leadership and operate as change agents, asking powerful questions that dig deeply into problems and reframing challenges to find new solutions.

5 *Fail forward with rapid-cycle improvement*

Data is the lifeblood of improvement, but only if we embrace our mistakes. Rapid-cycle improvement allows teachers to co-develop new approaches and then test and improve them based on the data they collect—and mistakes they find.

6 *Re-discover peer coaching*

We've long known that peer coaching is key to professional learning, but we often misuse it or overlook the real power of peers offering "critical friend" feedback to help one another move toward mastery.

7 *Reframe the goal*

Measuring student performance on standardized tests drives uninspired, low-level teaching and learning. If we re-balance testing by also incorporating performance assessments, we can create a more robust and accurate measure of student learning.

Setting the stage for teacher curiosity

By Cheryl Abla and Bj Stone

Remember Principal McGee from the movie "Grease"? Ms. McGee and her secretary, Blanche, spent most of their time worrying about how to keep students at Rydell High in line. Although she thought she had things under control, many of her students—Danny, Sandy, Rizzo, and the rest of the Pink Ladies and T-Birds—spent most of their time figuring out how to get *out* of line rather than engaging in what they were supposed to be learning.

Principal McGee epitomizes the traditional top-down principal, who sees her job as primarily getting students and teachers to do what she (or perhaps the district) wants, regardless of their interests or needs. You can just imagine the kind of uninspired staff meetings and professional development she would have led.

Fortunately, in today's ever-changing educational landscape, real-life Principal McGees are fewer and farther between. As school leaders have been saddled with increasing demands to raise student achievement—and with less time and fewer resources to do so—they are turning to teachers for help in many ways, including guiding their own professional learning by using a more reflective approach to what works in their classrooms.

For many school leaders, however, this is a fundamental change, and one that doesn't happen easily or quickly. To successfully implement such an approach, several factors need to be in place, the most important of which is an environment of care and trust—which comes from the relationships that a principal has with his or her teachers. If you're in a school with positive leader-teacher relationships, your next step is to continue to build on those relationships to create a culture where teachers also feel safe and empowered to ask questions, voice their opinions, and participate in decision making.

Developing an inside-out culture

An inside-out culture is one based on the internal reflection of teachers, where teachers reflect on what is or isn't working at the classroom level and then work together, with each other and their principal, to make adjustments that will lead to a more effective learning environment for students. Collectively, teachers build deeper meaning as they personalize their questions about teaching and learning around topics of interest and need. In addition, teacher engagement further increases when they are encouraged to intentionally and systematically

remain curious about what is working and not working and how to best move forward.

Developing such a culture begins with the principal's approach to this new way of thinking. Principals need to understand what it takes to build relationships with teachers and how they can help cultivate teachers' desire to want to improve their teaching and better help their students. A principal can *set the stage* for teachers' curiosity about their own learning and growing by using the following strategies:

1. Reduce the amount of principal decision making related to what professional development is selected. Asking teachers to participate in making decisions, both big and small, elevates teacher input and encourages personal and collective curiosity, while also providing the principal with important information about the needs of the school and the next steps to be taken. In schools where collaborative work is the norm, the principal provides time for teachers to reflect on their own practices so that they can clearly determine what is and isn't working in their classrooms. With the guidance of the principal, teachers will start to develop leadership skills as they uncover areas of strength and weakness, start to incubate ideas for improvement, and plan how to bring them to fruition. The demonstration of collaborative decision making, coupled with less defined roles, enrich outcomes that matter to all.

2. Ask more questions and deliver fewer answers. When determining the course of action for professional development, use inquiry-based questions to probe teacher thinking rather than offering solutions and answers. Curiosity is fostered and ownership deepens when questions are used to stimulate cognition/reflection and generate actions. When a principal is fairly certain teachers are not fully aware of available resources or options, it may become necessary to steer teachers with leading questions. In the end, the questions set curiosity into motion and drive the willingness of teachers to develop, invest in, and stay with an agreed upon course of action.

3. Be patient in allowing teachers to come to their own conclusions about what is working and what is needed next. Although it is much easier to read about being patient than to actually be patient, providing time for teachers to think, discuss, offer suggestions, and move forward generates far-reaching positive returns. Patience on the part of the principal means stepping back as the leader to allow time for learning, applying, failing, coaching, revisiting, honing, and, ultimately, developing ownership for the new practices. This may also encourage teachers to develop patience and step back in their own classrooms.

4. Encourage teachers to open up their classrooms and share with one another their successes and challenges. Morale and teacher participation soars when processes and protocols are put in place to allow for peer coaching opportunities. The deliberate inclusion of a peer-coaching model empowers teachers to engage in discourse about their approaches to teaching and learning and also increases teachers' willingness to admit shortcomings, request help, and learn from one another. By diminishing the amount of work done in isolation, instruction becomes more coherent and a culture of collaboration is strengthened.

Build on positive leader-teacher relationships to create a culture where teachers feel safe and empowered to ask questions, voice their opinions, and participate in decision making.

5. Foster a "we are all in this together" attitude. Developing a school culture based on curiosity-focused thinking provides a springboard for collaboration as principal and teachers come to understand they are each a piece of the successful school puzzle. This provides an important shift for all school personnel to view themselves as leaders and make contributions that matter to all.

While Rydell High and its characters are fictitious, creating a teacher-empowered school culture can become a reality if principals are intentional about building relationships and setting the stage for teacher reflection, curiosity, and increased ownership of their professional learning. The more teachers experience this as a constant, the more likely they are to cultivate these behaviors and values in their classrooms—to the ultimate benefit of all students.

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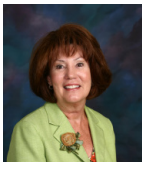

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Hand the controls over with formative assessment

By Kathleen Dempsey and Adena Miller

Playing video games, like it or not, is an activity that engages school-aged children more than almost any other. But think about what's happening when kids play: They clearly know the goals of the game, whether or not they're achieving them, and what it takes to get to the next stage. Each new stage gets a little harder, but not so hard that they can't succeed—so they do the same level over and over until they get it right. They may be killing zombies, but they persevere; they celebrate and take pride in their accomplishments.

Every teacher would welcome that kind of engagement in the classroom. But years of high-stakes standardized testing has, unintentionally but unfortunately, disengaged many students from the learning process. Too many teachers have become over-focused on testing, and tests have become too frequent and often meaningless (Hofman, Goodwin, & Kahl, 2015).

Outside of the classroom, however, kids playing video games are unknowingly participating in a research-proven way to engage students in their learning: formative assessment. No doubt you and your teachers are familiar with and have probably used formative assessment in one way or another, but now is the time to reimagine the process through a student lens.

A different way of thinking

Over the years, the potential of formative assessment to transform teaching and learning has been limited by poor or inconsistent implementation and by teachers using the data themselves but not encouraging their students to do so.

An inside-out approach to formative assessment means that the teacher's role is to provide students with relevant, meaningful learning experiences and the structured autonomy to reflect on their learning and be *continually aware* of where they are in the process and what the next steps toward mastery are. As a result, students are more engaged and have a heightened sense of accountability.

Doing this well is no easy task; it takes not only careful thought and planning but also a different way of thinking about how and why learning occurs and the roles teachers and students play (Hofman, Goodwin, & Kahl, 2015). Teachers must be comfortable with the idea of assessment not as an event but as a process.

Empowering students and teachers: One district's success

Colorado Springs District 11 in southern Colorado had been focusing on improving teacher practices and formative

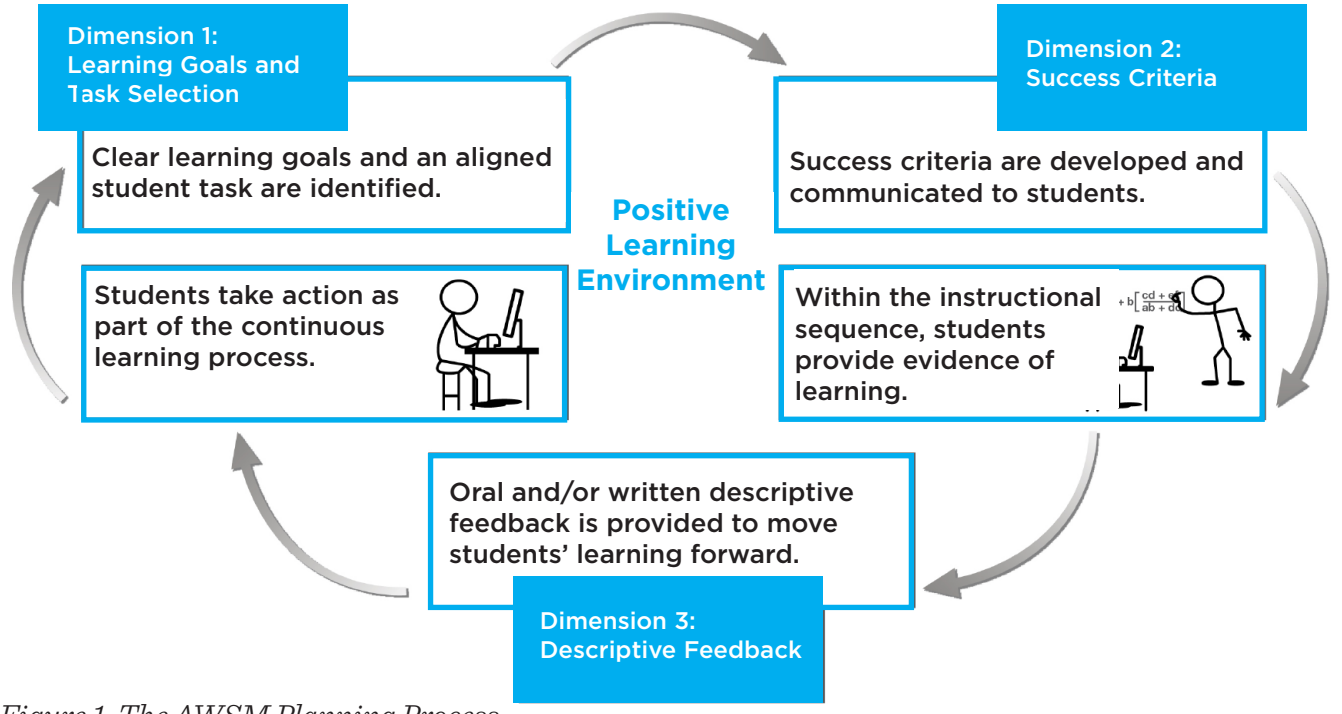

Figure 1. The AWSM Planning Process

assessment approaches for a few years. Because teachers had received little support to guide the implementation of formative assessment during their pre-service programs, District 11 was looking for professional development (PD) to help meet this need.

McREL approached the district with an opportunity to take part in the development and piloting of a mathematics formative assessment program for middle school teachers called Learning to Use Formative Assessment in Mathematics with the Assessment Work Sample Method (AWSM)—which offers a way to collect, create, discuss, and learn from authentic samples of student work.

The program sought to shift teachers' belief that *teaching is something teachers do* to *learning as something students do*. Outcomes included not only improving teacher practices for implementing formative assessment but also improving classroom culture, increasing student ownership of learning, and increasing individual and group accountability for learning.

The AWSM program led teachers through the formative assessment process and helped them develop and use high-quality assessment practices in their classrooms. At the beginning of the year, teachers completed a pretest of mathematics content knowledge and an assessment work sample. PD sessions continued throughout the year, focusing on actual student and teacher work to help teachers develop a deep and practical understanding of and ability to use formative assessment in mathematics.

Teachers learned about three dimensions of the formative assessment process:

- Ensuring clear learning goals and well-aligned student tasks
- Defining success (mastery) criteria and communicating the criteria to students
- Building teachers' knowledge and skills to assess student progress and determine the best responsive action

The first two dimensions are crucial for establishing a foundation for the process; without them, feedback may lack focus and be of limited use to students. Teachers worked collaboratively to analyze and align goals, criteria, and student tasks from anonymous work samples. Figure 1 illustrates the planning process AWSM teachers engaged in to ensure high-quality learning goals and success criteria.

To build their assessment knowledge and skills, teachers reviewed class results on formative tasks to determine which students were ready to extend their learning, who needed only descriptive feedback, and who would benefit from additional instruction and feedback. Teachers honed their skills for providing descriptive oral and written feedback aligned to the goals and criteria, rather than general, subjective statements such as "good job" or "work harder."

They also learned to resist providing feedback that is too specific. For example, mathematics teachers sometimes provide step-by-step notes on how to correct a solution, which has the unintended consequence of keeping the responsibility for learning with the teacher rather than with the student. Instead, providing feedback with cues such as, "Remember our work with similar figures," questions such as, "How do you know the area is equivalent?," and recommendations for next steps like, "Check your notes from

Providing feedback with cues such as "Remember our work with similar figures," questions such as, "How do you know the area is equivalent?," and recommendations for next steps like, "Check your notes from Tuesday," all help students take ownership and responsibility for learning.

Tuesday," all help students take ownership and responsibility for learning (Dempsey, Beesley, Clark, & Tweed, 2015).

Probably the most challenging part of the process is getting students to become active partners in the feedback process. Teachers learned and implemented peer assessment practices through a "gradual-release" process that builds students' abilities to discern attributes of success criteria. As students developed these skills, they participated in activities that ranged from simple checks (identifying the presence or absence of required attributes) to more complex analysis (assessing a peer's work for solution accuracy and quality of response). They learned to identify both strengths and recommendations for improvement based on the assignment's success criteria. Teachers monitored the process and conducted whole-group debriefings to make sure students received accurate feedback from peers. As students developed skills for using and applying success criteria, they became empowered to objectively assess their own work and were more reflective, motivated, and engaged in the process.

Teachers at every school struggled with students who initially resisted ungraded practice and expected a grade for every activity. Many students naturally associated receiving a grade with the importance of the task and, thus, ungraded tasks seemed unimportant. Teachers had to persist with this technique until students understood the advantages, such as waiting until students had sufficient practice to grade them and helping the teacher better understand the student's progress.

Taking learning to the next level

After compiling data from the assessment practice findings, pre- and post- student work samples, PD session observations, participant surveys, and participant focus groups, McREL found that the AWSM program improved teacher practice of formative assessment by the end of the school year. It also enhanced teachers' planning and implementing as they used the data to inform their instruction and involved students in the process.

Teachers reported implementing four specific formative assessment strategies during the year: 1) using a non-graded quiz, 2) providing descriptive feedback to students, 3) assessing students while they worked in class to provide immediate oral feedback, and 4) clearly communicating learning goals and success criteria to students.

"AWSM has helped me realize that differentiation is crucial," one teacher said. "It helps me look for the outliers in my classes—the ones who are overachieving and the ones that are falling behind. I already knew about formative assessment, but AWSM has brought it into focus."

Classroom culture, particularly teacher-student relationships and student-student interactions, became more positive, too. Ultimately, using formative assessment to ensure students understand their own growth toward learning targets and the next steps they need to take to achieve them resulted in students being more motivated, engaged, *and* persistent with mathematical problem-solving.

Take *that*, Minecraft.

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[Q&A] Connecting content, curiosity, and experience with project- and maker-based learning

Monica & Tyler Aiello

Whitney Cobb

Project-based learning is nothing new—many of us remember well the days of "shop" and home economics, but the idea of *learning by doing* actually goes back about as far as formal education itself. Today, however, with advances in technology, a focus on 21st century skills, and more rigorous academic standards, educators are embracing it now more than ever as a way to engage all students and deepen their learning across the content areas.

In both traditional and informal classroom settings, more and more teachers are using hands-on, student-directed projects that value the process of learning as much as the end product. Maker experiences, for example, which encourage students to invent, tinker, and construct, have become increasingly popular—particularly in STEM (science, technology, engineering, and math) or STEAM (STEM + arts) settings.

Artist-educators Monica and Tyler Aiello of Eurekus, a STEAM program development organization that was a finalist for the 2015 US2020 STEM Mentoring Award, talk with us about how maker- and project-based experiences help connect the dots between content, curiosity, and experience. Joining them is McREL consultant Whitney Cobb, who, in partnership with Eurekus and NASA, develops interdisciplinary projects for students to investigate our solar system using NASA's Discovery and New Frontiers missions as springboards for inquiry.

How are maker- and project- or problem-based learning (PBL) environments different from traditional classroom environments?

Tyler Aiello (TA): Some kids are better at memorization and rote learning, but other kids are better at observation and problem-solving. With maker- and project-based learning, *everybody* in the classroom is working together—not necessarily on the same project, but on the same problem—learning from each other, learning what their strengths and weaknesses are, and who they need to go to for help.

Whitney Cobb (WC): The teacher's role is different; it doesn't always have to be the teacher who is the expert in the room. As educators, we have to take a deep breath and let ourselves be learners alongside our students. In this environment, students see everyone in the room—not just adults—as potential resources. Giving students a voice in the direction of their own learning also fosters a more equitable classroom, one which empowers all students, including diverse learners.

Monica Aiello (MA): When learners guide so much of the conversation, there's no way for teachers to predict and become experts at every question they might have. When teachers don't have the answer to every question, they get to sit down with students and co-discover, co-make, co-learn—and that empowers the students. It's not just that the kids are transforming and the teachers are transforming, but this kind of problem-based learning is increasingly becoming our way of negotiating this world.

What role does curiosity play in a making environment?

MA: In our programs, we identify the topic area we're going to explore, and then try to inspire the students to ask questions as they engage in the making and creative process. What door of inquiry they go through is up to them. We also build on their curiosity by scaffolding experiences.

Initially, students are individual investigators who engage in variety of creative projects. Then, as their knowledge builds, they are able to work with other students to develop a collaborative capstone project that synthesizes the learning they've had as a creative community.

We recently did a project with some students on the water cycle and hydrology. Students made kinetic water-cycle models with crank wheels—basically, high-tech dioramas. One student investigated acid rain and created a futuristic scene about dynamic changes happening on Earth. Another student said, "I don't want to do water. Can I do the methane cycle on Titan?" And we said yes, because he was still investigating systems, cycles, conversions, states of matter, and impact to natural systems.

WC: It's important to remember that teacher curiosity is as important as student curiosity. Our students are watching us. Just as we're expecting them to reflect on what works and what doesn't work, we have to reflect on our practice—as educators and role models—and how we, too, contend with challenge and failure.

What happens when a project fails?

MA: We spend a lot of time asking, *Will this work?* I guarantee every student will reach a point in his or her project when something doesn't work. And that's great! That's our opportunity to look at it together, troubleshoot, isolate our variables, figure out what's not working, and come up with solutions. Failures are as important as successes.

WC: Constructivist learning considers failure a natural and positive part of a rigorous learning process. When the batteries or circuits aren't working, beliefs change from *I can't* to *Hmmm... I'll keep trying*, swinging open the windows to deeper understanding. Persistence in the face of failure in a supportive, equitable environment allows maker experiences to become more than learning opportunities; they become metaphors for the power of collaborative engagement and networking in helping students understand their world and make a difference.

Do content standards or cross-curricular learning play a role in maker-based experiences?

WC: In the Next Generation Science Standards, assessments value process over content for the first time. STEM classrooms not only should, but *must* strive to integrate elements of literacy and math standards, to help students build the capacity to think flexibly and comprehensively. Maker-based experiences, project-based learning, design-based thinking, STEAM—they all invite cross-curricular integration and real-world application of language and math.

The educators' role is to help make the learning process overt: Establish a vocabulary wall and ask everyone in the room to note new words and connotations. Show kids how to use mathematical models to analyze the effectiveness of their designs and watch them make new connections. Insist that students articulate what they're learning, verbally and in writing.

MA: If you design a robust, transdisciplinary program, you can really investigate all aspects of STEM simultaneously while fusing fine arts and liberal arts into the mix. With thoughtful programs, you can address many content standards at one time, from STEM and literacy to social studies.

We've seen results of this in both classroom interactions and test scores. In one kindergarten classroom, for example, students were creating exoplanets using two-

Test taking is not a useful skill in the workforce. We need people who are articulate, are effective writers and collaborators, have the skills to understand models, and can tackle problems of many dimensions.

dimensional shapes related to geometry standards in the Common Core. One boy working with a parent volunteer asked for a hexagon—and then cut it in half. The parent asked, "What are you doing?" and he said, "I'm making a trapezoid." When they begin using academic language correctly like that, you know they're absorbing the content.

In another school where we developed a program that investigated simple machines, 2nd-grade students initially scored, on average, in the 15th percentile on the standard assessment, which was on foundational concepts and vocabulary. After one semester of STEAM enrichment, their scores rose to the 87th percentile.

Why is process-oriented learning important for 21st century students?

WC: Test taking is not a useful skill in the workforce. We need people who are articulate, are effective writers and collaborators, have the skills to understand models, and can tackle problems of many dimensions. Maker-and project-based learning experiences help you perceive and understand complex systems, and become flexible and adaptable.

MA: I had a parent say to me, "I love all the science stuff you're teaching my child, but more than anything, I love the process you're teaching her." Every day, we go in and look at something, ask questions, present a problem, come up with a solution or idea, test it, evaluate it, and revise it. Students are engaging in an iterative, cyclical process that they will use throughout their lives. This will help students become informed citizens who are able to come up with solutions to real-world problems of all kinds.

Additional resources
For more information about Eurekus, please visit Eurekus.org.

To learn more about NASA programs and missions, visit the program websites:
Discovery.NASA.gov
NewFrontiers.NASA.gov

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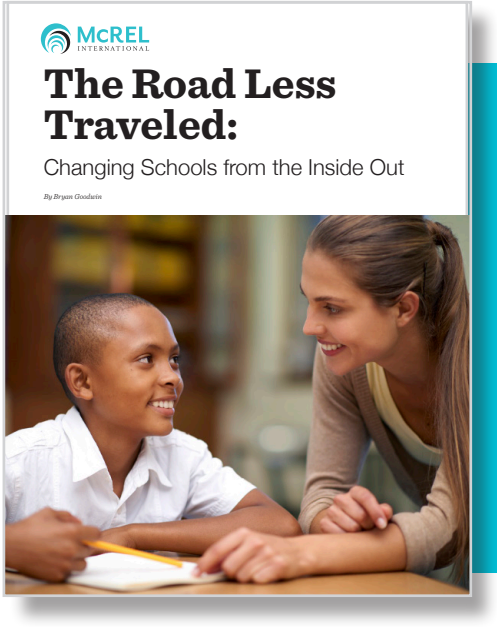

Read the white paper

McREL's latest white paper urges educators to rethink the current top-down approach to reform and consider what might happen if we improve schools from the inside out.

Download today at www.mcrel.org/the-road-less-traveled/.

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