

Curriculum and Instruction: Introduction

Center on Instruction/National High School Center

Many curriculum and instruction strategies can lead to school reform and improved student learning. Student performance data are integral to both; large group student data identify and support the implementation of research-based instructional programs, while student- or class-level data inform instructional changes that serve the academic needs of individual students. Data can be used to confirm whether instructional programs align with state academic standards, and ensure vertical alignment among grade levels.

Data systems should allow for the collection, interpretation, and use of data to drive instructional change at the classroom, school, district, and state levels. Additionally, data about teachers' instructional practices can help determine the fidelity of implementation in instructional programs and can supply information about professional development priorities.

Among some of the specific curriculum and instruction strategies schools might consider with an eye toward comprehensive instructional reform are:

- *Response to Intervention*, which is a multi-level instructional framework. It includes the use of universal screening for all students as well as core instruction. Students demonstrating a need for support receive increasingly intensive interventions and ongoing progress monitoring.
- *Differentiated instruction*, an instructional approach in which a teacher incorporates an array of research-based instructional and organizational practices as a means to accommodate student differences in learning.
- *Accelerated instruction*, a strategy especially useful in reading and mathematics instruction. Rather than the slow-paced and reduced curriculum that remediation models have used, in this strategy teachers accelerate instruction of students to help them overcome educational deficits and “catch-up” to their peers. The successful use of this strategy increases the likelihood that even struggling students will be prepared to enroll in challenging grade-level courses.
- *Incorporated technology* has recently received attention for its potential to support instruction in all content areas and for all grade levels.

At the high school level, curriculum and instruction are geared toward preparing students for postsecondary success. While the topics in this chapter have implications for all K-12 grade levels, four strategies specific to high

school are addressed: (1) accelerating instruction of basic reading 9-12; (2) accelerating instruction of basic math 9-12; (3) providing advanced coursework; and (4) implementing competency-based instruction.

Students who enter high school as struggling readers will most likely have a harder time in content area classes, not just in English/language arts. Most high school teachers assume students have sufficient reading comprehension levels and strategies that allow them to learn content in all classes. However, data now suggest this assumption is incorrect. High schools must provide basic instruction in reading and embed literacy strategies in all content area classes for every student to master high school content. Similarly, providing accelerated instruction in mathematics is essential for students who enter high school several grade levels behind. At the same time, high schools are challenged as they also seek ways to provide all students with more opportunities to enroll in advanced coursework.

This chapter closes with a discussion about implementing competency-based instruction, the fourth high school-specific strategy about non-traditional strategies for students to demonstrate content mastery.

Aligning Instruction (Vertically and to Standards)

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If students are to demonstrate proficiency on state standards, cognitive demand and classroom content must align to standards and assessments (Bhola, Impara, & Buchendahl, 2003). Alignment of curriculum, assessment, and instruction requires analysis of standards, policies, and practices in states, districts, schools, and classrooms (LaMarca, Redfield, & Winter, 2000; Martone & Sireci, 2009; Porter, Smithson, Blank, & Zeidner, 2007). Alignment of instruction links the content of state standards and district curriculum frameworks (the intended curriculum) with what is actually taught in the classroom (the enacted curriculum) (English, 1980; Blank, Porter, & Smithson, 2001). Processes for alignment vary in complexity and evidence of effectiveness (Bhola, Impara, & Buchendahl, 2003; Porter, Smithson, Blank, & Zeidner, 2007).

In all cases, for teachers to identify and activate the explicit connections between instruction and standards, and therefore improve student performance, they must be involved in the process of making those alignments. (Applebee, 1996; Koppang, 2004; Langer, 2001).

When instruction that is aligned to standards is implemented in classrooms, students should be able to perform at higher levels of proficiency on assessments. Analysis of student performance data can then become a useful tool to provide powerful guidance when schools make resource allocations, introduce changes in curricular emphasis, establish connections across grades and content areas, select instructional materials, and develop processes for building professional capacity (Bhola, Impara, & Buchendahl, 2003; Gamoran, Porter, Smithson, & White, 1997; LaMarca, Redfield, & Winter, 2000; Blank, Porter, & Smithson, 2001).

Action Principles

For State

1. Provide guidance about the alignment between state standards and assessments (e.g., areas of emphasis, cognitive demand, use of data to determine degree of alignment of instruction to standards) and provide examples, release test items, and disseminate policy interpretation (Bhola, Impara, & Buchendahl, 2003; LaMarca, Redfield, & Winter, 2000; Porter, 2002).

For District

1. Provide support (technical, expertise, and resources) for an alignment process that considers resources, local context, and intended outcome (Bhola, Impara, & Buchendahl, 2003; Porter, Smithson, Blank, & Ziedner, 2007).
2. Support capacity-building for school staff and faculty members to help them understand the analysis and make strategic plans to implement action steps to address instructional adjustments and needed resources (Bhola, Impara, & Buchendahl, 2003; LaMarca, Redfield, & Winter, 2000; Porter, Smithson, Blank, & Ziedner, 2007).

For School

1. Conduct investigation to align school/teacher enacted curriculum, state standards, and local curricula, including articulation across grade levels and content areas (Bhola, Impara, & Buchendahl, 2003; Blank, Porter, & Smithson, 2001; English, 1980; Glatthorn, 1999; Kurz, Elliot, Wehby, & Smithson, 2009; McGehee & Griffith, 2001; Porter, Smithson, Blank, & Ziedner, 2007).
2. Provide resources (e.g., time, expertise, planning support, professional development) to enable teachers to incorporate changes required to align instruction with standards (Blank, Porter, & Smithson, 2001; English, 1980; Koppang, 2004).
3. Build capacity to monitor and maintain alignment between curriculum standards and classroom instruction, including use of formative data (Blank, Porter, & Smithson, 2001).

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Differentiating Instruction

Center on Instruction

Differentiating instruction allows classroom teachers to provide effective instruction to all students.

Differentiating instruction is not a single strategy or practice but rather an approach that utilizes research-based instructional and organizational practices to accommodate student differences in the classroom. Teachers can differentiate instructional content, process, product, and/or learning environment based on student readiness, interest, and/or learning profiles (Tomlinson, 2001) to respond to the unique needs of each student. Some examples of differentiated instruction include: using various grouping practices such as small groups, pairs, and one-on-one instruction; modifying assignments so that all students can participate in learning; providing opportunities for students to respond in multiple ways including writing, orally, and by providing responses to peers; and using effective instructional strategies such as reteaching, using multiple examples, and teaching strategies for how to read, complete math problems, or remember content.

Action Principles

For District

1. Provide professional development on differentiated instruction for classroom teachers.
2. Utilize coaching methods to support teachers as they learn to implement differentiated instruction in their classrooms (Newman & Singer, n.d.).

For School

1. Continually assess students to obtain valid data and use this student data to inform instructional decisions and determine appropriate grouping patterns (Tomlinson & Allan, 2000; Tomlinson, 2001; Moon, 2005).
2. Use grouping strategies to meet the individual needs of students within the broader group context and design instructional tasks for each group to align with educational goals (Hall, 2002).
3. Use differentiated instructional strategies to include special education students in the general education curriculum (Boderick, Mehta-Parekh, & Reid, 2005) and to respond to the unique needs of diverse gifted learners (VanTassel-Baska & Stambaugh, 2005).
4. Use student-centered activities (SCAs) to differentiate reading instruction for elementary students (Kosanovich, Weinstein, & Goldman, 2009).

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Using Student Data to Drive Instruction

Center on Instruction

The *Using Student Achievement Data to Support Instructional Decision Making* practice guide published by IES defines data-based decision making as “...teachers, principals, and administrators systematically collecting and analyzing various types of data, including demographic, administrative, process, perceptual, and achievement gap, to guide a range of decisions to help improve the success of students and schools” (pp. 46). A number of activities and decisions undertaken by schools and districts involve data-based decision making, such as screening students for placement, using progress monitoring or formative assessments to determine curricular changes, and interpreting annual performance data to identify areas of weakness for future educational focus.

Data systems allow for the collection, interpretation, and use of student data. A universal screening system can be used at the beginning and middle of the school year to identify students who are academically on-track and those who are at-risk for difficulties in key critical content areas, such as reading and mathematics (Gersten, Beckmann, Clarke, Foegan, Marsh, Star, & Witzel, 2009; Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008). At-risk students can be selected to receive research-based interventions. Schools can then use progress monitoring data (collected on a frequent basis) to gauge the students’ progress (or response to an intervention) towards critical academic outcomes (Tilly, 2008). Formative assessments can be collected in classrooms to give teachers feedback about students’ understanding of the material presented and what minor adjustments to their instruction may be needed to improve students’ understanding.

Employ the use of data systems in broader decision-making by utilizing annual state testing results to evaluate the effectiveness of their instructional systems. For example, a district may implement a new core reading series and analyze state testing results to determine if the new reading series is increasing student outcomes, or they may look at areas of poor performance in state testing results to determine where to allocate professional development dollars.

Action Principles

For District

1. Develop a data system or adopt an available data system that enables analysis of student outcomes at multiple levels (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).
2. Develop a district-wide plan for collecting, interpreting, and using data. Dedicate time and develop structures for district schools and teachers to use data to alter instruction (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).
3. Train teachers and principals in how to interpret and use data to change instruction (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).
4. Use annual state testing performance data to evaluate the overall effectiveness of instructional services provided by the district. Conduct deep analysis to determine areas in need of improvement (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).

For School

1. Identify which students are at risk for difficulties with certain subjects, such as mathematics or reading, and provide more intense instruction to students identified as at risk (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009; Gersten, Beckmann, Clarke, Foegen, Marsh, Star, & Witzel, 2009; Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008).
2. Employ efficient, easy-to-use progress monitoring measures to track the progress of students receiving intervention services towards critical academic outcomes (National Center on Response to Intervention, n.d.; Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009; Gersten, Beckmann, Clarke, Foegen, Marsh, Star, & Witzel, 2009; Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008).

3. Use formative assessments to evaluate learning and determine what minor adjustments can be made to instruction to enhance student understanding (The National Center for Fair and Open Testing, 2007).

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Using Instructional Practice Data to Alter Strategies

Center on Instruction

Large-scale efforts to improve professional development for practicing teachers have emerged in recent years. Administrators face the central question “What decisions will create positive changes in classroom practice?” Good decision making relies on student performance data and teacher instructional practice data. One method that utilizes instructional practice data is Japanese Lesson Study, which has three core components: teacher observations by colleagues, critical analysis, and constructive feedback. These instructional practice data inform the teacher of strengths and weaknesses during lessons that would be addressed and corrected in the next lesson.

Teacher study groups also utilize instructional practice data by incorporating a five-phase process: Debrief, Discuss the Focus Research Concept, Compare Research with Practice, Plan Collaboratively, and Make an Assignment. During each session, participants begin by debriefing the lesson they collaboratively planned in the previous session. Teachers describe the lesson they taught, report on any adjustments they made while teaching the lesson, and discuss how students responded. Next, teachers read and discuss a current focus research concept. Afterwards, they compare how the research aligns with the instructional design of their current reading program. Last, they incorporate the focus research concept into the lesson they collaboratively plan and then teach the lesson.

Coaching cycles present another method for collaborative use of instructional practice data. Literacy and math coaches follow a deliberate cycle to scaffold teachers’ ability to implement new ideas effectively. The cycle involves holding a pre-observation conference to discuss the goals of the lesson; observing a lesson that focuses on the aspects that have been jointly agreed upon; and debriefing to analyze the instructional data. The cycle continues with a discussion about changes the teachers will make to future lessons. During this process, coaches encourage teachers to use reflective practices. The more they learn about teaching and learning, the more accurately they can reflect on what they are doing well and what needs improvement (Darling, Hammond, & Bransford, 2005).

The most traditional and widely used method of collecting instructional data to alter strategies is the teacher evaluation. Although classroom observations and feedback are the most common practices, examining lesson plans, self-assessments, portfolio assessments, and review of student work samples can also be used.

Action Principles

For District

1. Develop a district-wide plan for collecting, analyzing, and interpreting instructional practice data. Organize district leadership teams responsible for developing protocols or other instruments that can be used as data gathering tools.
2. Provide ongoing professional development and support to administrators, coaches, and instructional leaders so they will be able to effectively implement systems that utilize instructional practice data. Situate learning within a triadic model of assisted performance where administrators provide assistance to coaches; coaches to teachers; and teachers to students (Tharp & Gallimore, 1988).
3. Allocate resources to support the method (e.g., materials, released time, and stipends).
4. Redesign traditional teacher evaluation systems to use instructional practice data including self-assessments, portfolios, and teacher reflection.

For School

1. Determine which method for using instructional practice data will be used and provide ongoing professional development (Hall & Hord, 2001; Gersten, Dimino, Jayanthi, Kim, & Santoro, 2009; Watanabe, 2002; Hasbrouck & Denton, 2005).

2. Identify the group or individual teachers who will participate. This is often based on identifying classrooms where student need is the greatest.
3. Allocate time to implement the method.
4. Provide consistent administrative support (Hall & Hord, 2001). Make adjustments that create blocks of time for teachers to collaborate; find appropriate ways to acknowledge teachers who try to improve their practices, ranging from informal appreciation (such as a “thank you”) to more concrete rewards such as stipends or graduate credit.

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Determining Teacher Effectiveness

National Comprehensive Center on Teacher Quality

Teachers are central to any effort to improve instruction. Yet not all teachers are effective. According to a recent survey, nearly 60% of teachers say they work with a few teachers who are simply going through the motions, failing to do a good job. More than 1 in 5 teachers would describe “more than a few” or “quite a large number” of their colleagues in this way (Coggshall, Ott, Behrstock, & Lasagna, 2009). Regular and consistent assessment of teacher skill and knowledge at various points along the educator’s career continuum will result in sound hiring and performance management decisions, needs-based professional development, and data to support opportunities for career growth. But determining teacher effectiveness is no easy task. It first requires a thorough understanding of what an effective teacher does and the competencies needed to carry out these tasks. The process should also take into account the specialized roles and context of teachers. For example, does an effective teacher look different at the elementary and high school level? Do teachers serving in a consultant capacity, such as those who teach special education or English language learners, require a different or additional set of skills to be considered effective?

Defining effectiveness also requires using valid and reliable tools for assessing whether an individual teacher possesses these competencies. Students’ standardized test scores, particularly value-added test scores, represent one approach to measuring teacher effectiveness. Although test scores are currently under-utilized as a measure of teacher effectiveness, the research is clear that test scores should not be the sole means of determining teacher effectiveness. Policies that require and establish multiple, reliable measures (i.e. performance observations, evaluation of classroom artifacts, and/or portfolio and student/parent evaluations) contribute to a solid, comprehensive approach to determining whether a teacher is highly effective.

Finally, determining teacher effectiveness requires deciding what to do with the information gathered in order to improve the quality of instruction for students. Districts should contemplate whether this information can or should be used to make personnel and compensation decisions, to inform professional development, and/or to identify teacher leaders.

Action Principles

For District

1. Determine what skills and knowledge an effective teacher must possess.
2. Determine what outcomes an effective teacher must produce.
3. Determine if the context and role in which teachers work require that additional competencies be identified.
4. Develop a comprehensive system, including multiple valid and reliable tools, and regular assessments for determining whether a teacher possesses the necessary skills, knowledge, and competencies.
5. Establish clear outcomes for identified levels of effectiveness, from remediation, to professional development, to positive incentives.
6. Involve teachers in the process of defining teacher effectiveness.

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Using Response to Intervention

Center on Instruction

RTI is a multi-level framework designed to support students who are at-risk for poor learning and behavior outcomes. It includes: appropriate, research-based instruction in reading and mathematics for all students; universal screening (e.g., easily administered screening measures to identify students with mathematics, reading, and behavior problems); increasingly intensive instructional interventions for students who need them (e.g., interventions are provided for identified students for 30 minutes per day for three to five days and then increasingly more intensive interventions are provided if students make inadequate progress); and progress monitoring (USDE, 2009). An RTI framework can provide part of the data used to decide if a student should be evaluated for learning disabilities (LD).

Action Principles

For State

1. Provide guidance, professional development, and technical assistance to pre- and in-service teachers and other school and district personnel on how to use RTI in academic content areas such as reading and mathematics and in behavior management with all students in all grades (Bocala, Mello, Reedy, & Lacireno-Paquet, 2009; Harr-Robins, Shambaugh, & Parrish, 2009; Sawyer, Holland, & Detgen, 2008).
2. Facilitate buy-in and collaboration by involving and training a wide variety of stakeholders at the state leadership level and encouraging similar practices at the district and school levels (Goe & Cogshall, 2007; Mohammed, Roberts, Murray, & Vaughn, 2009).

For District

1. Build consensus by communicating state goals to schools and vice versa, involving key stakeholders, providing administrative supports, and fostering collaboration among all educators.
2. Build infrastructure by addressing schools' RTI needs, aligning state and school roll out plans, and supporting implementation and evaluation through professional development and technical assistance (NASDSE, 2008).

For School

1. Focus on the essential elements of RTI: high-quality, research-based instruction for all students and interventions for struggling students, universal screening, progress monitoring, fidelity, and evaluation (Foorman, Francis, & Fletcher, 1998; Harr-Robins, Shambaugh, & Parrish, 2009; Vaughn & Fuchs, 2003; Vellutino, Scanlon, & Lyon, 2000).

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Choosing and Implementing Technology Wisely

National High School Center

The effective integration and implementation of educational technology is critical to ensure that these tools can make a difference in the academic achievement of all students. These ever-changing technologies include computers, mobile/handheld devices, interactive white boards, social media and multimedia tools, simulations, and games. Research indicates that technology must be used in ways that align with curricular and teacher goals, and offer students opportunities to use these tools in their learning. The findings from a National Research Council report underscored this point, “In general, technology-based tools can enhance student performance when they are integrated into the curriculum and used in accordance with knowledge about learning. But the mere existence of these tools in the classroom provides no guarantee that student learning will improve; they have to be part of a coherent education approach” (Bransford, Brown, & Cocking, 2000). As technology tools continue to evolve, their role in teaching and learning can follow various paths, including computer-based assignments and plans; online/distance learning courses; assessment; research-based educational programs (software and internet-based); and a growing number of online and stand-alone resources and tools.

Growing evidence supports the use of educational and assistive technologies (AT) to enhance teaching and learning for students with disabilities. Over the past ten years, there has been a significant growth in AT tools to provide students with assistance in acquiring reading, writing, and mathematics skills. These AT tools enable students with disabilities to perform tasks that they might not otherwise be able to do on their own. For example, text to speech supports students with print-related disabilities, alternative input devices support computer use for students with physical disabilities, and augmentative communication devices provide support for students with communication disorders.

Research and needs assessments conducted by the National Center for Technology Innovation (NCTI) and the Center for Implementing Technology in Education (CITEd) have led to the creation of two decision-support tools, *The Consumer Guides* and the *EdTech Locator*. These tools help school administrators make informed decisions relating to educational and assistive technology. The *Guides* suggest questions to ask technology vendors and issues to consider in the following five areas:

- Alignment of standards and curriculum goals;
- Implementation of technologies;
- Scientifically-based research;
- Funding for purchasing educational technology; and
- Federal legislative mandates such as Individuals with Disabilities Education Act (IDEA) and the Elementary and Secondary Education Act (ESEA).

The *EdTech Locator* focuses on the work of a technology implementation team in a district or school, outlining the responsibilities for administrators, technology coordinators, professional development coordinators, and teachers. The action principles below are drawn from both resources.

Action Principles

For District

1. Develop guidance for schools on aligning technology products and classroom curriculum.
2. Create a school or district-wide technology implementation team made up of administrators, technology coordinators, teachers, and professional development coordinators to identify key areas of focus for implementation efforts.
3. Work with district or regional educational technology resource centers to establish a list of technology products that address state standards and meet the needs of all students, both with and without disabilities.

4. Collaborate with educational technology resource centers to develop training programs to help district teachers use AT and integrate them into existing curriculum.
5. Consider participating in technology studies conducted by research organizations and local academic institutions.
6. Collaborate with other districts to reduce unnecessary spending and to identify effective technology interventions.
7. Identify grants from state agencies and foundations to purchase needed technologies.
8. Establish public-private partnerships in communities with businesses to build a sustainable technology infrastructure.

For School

1. Ensure that teachers are comfortable using technology for their own productivity and professional learning.
2. Work with professional development and instructional media leaders to integrate technology into instructional initiatives.
3. Create opportunities for teachers to work together to practice with new technologies before using them instructionally.
4. Consider low- or mid-tech devices that can meet the needs of students with lower purchase and maintenance costs.
5. Take advantage of trial periods or demonstration copies of software to ensure that technologies meet the needs of students.
6. Apply for grants from the local school district, state, business partners, and foundations to purchase technologies.

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Using Performance-Based Student Assessments

Assessment and Accountability Comprehensive Center

Performance-based student assessments play a powerful role in validating and monitoring the growth of all students and the success of curriculum and instructional programs. This importance increases in the context of persistently low-achieving schools, in which student growth can be fostered by learning experiences and performance opportunities that invite students to show what they can do with what they are learning. This strategy is not only sound pedagogically, but highly motivating and empowering for students. Such assignments, accompanied by appropriate instructional support, challenge each student to do or create something of value to themselves and others and to take the next step forward in their academic growth.

Performance-based assessments provide key opportunities for students to engage in tasks like those they will be asked to do in higher education and careers. Such tasks often take extended time and concentrated effort, and may call on students to plan, work cooperatively, and communicate results in a variety of formats. Performance tasks and assessments can be designed to call on students to display higher-order thinking skills and to integrate knowledge, skills, and conceptual understanding to successfully complete the assignment. The “doing” implicit in such tasks allows the assessment of a student’s developing cognitive and behavioral capacities for successful achievement.

High quality performance-based student assignments and assessments have the power to

- integrate students’ knowledge, skills, conceptual understanding, and performance capacities;
- allow students to monitor their own growth and apply clear performance standards to their work; and
- motivate students to set challenging learning goals meaningful to themselves, to strive for excellence, and to celebrate growth and achievement along the way.

Performance-based assignments and assessments can, in the context of project-based learning, become the ongoing central activities and assignments of the instructional program. Such rich and powerful assignments can provide an integrating context for knowledge and skills acquisition, accelerating learning in these specific areas as well.

Performance-based student assessments take more time to administer, often are tied directly to specific curriculum and instructional programs or particular assignments, and take more time for scoring, reporting back the results, and putting the results to effective use with students than do standardized tests.

The assessment challenge, at both the district and school levels, is to develop the capacity of classroom teachers to evaluate student work in shared and common ways, often using established rubrics or scoring criteria to evaluate student products and performances. The results are often complex and nuanced; the student work on such tasks is typically neither right nor wrong, but rather, combines a variety of strengths and areas needing improvement. Such evaluations can inform summative judgments, but, most fruitfully, they provide formative instructional guidance, challenging teachers to use the results to help students take the next steps towards excellence.

Action Principles

The fundamental action principle for states, districts, and schools is to integrate performance-based assessments and their results into their local and classroom assignments and assessments as a core part of instructional systems.

For State

1. Encourage the use of multiple measures, including performance-based assessments, in district and classroom assessment and accountability systems.
2. Provide professional development on the use of performance-based assessments locally to improve the alignment of student activities and assignments to the statewide standards and to monitor student growth.

3. Provide professional development to assist districts and schools to develop professional learning communities that address performance-based assignments and assessments.
4. Selectively employ powerful performance-based assessments in statewide assessments in language arts, science, mathematics, and social science.

For District

1. Ensure that all students have access to rigorous, standards-based instructional programs that address higher-order thinking skills and integrated performance.
2. Ensure that student assignments and assessments employ performance-based assessments among the multiple measures used to monitor student growth.
3. Provide professional development that teachers need to develop, evaluate, and learn from performance-based assessments.
4. Monitor the implementation of instructional programs incorporating standards-aligned, performance-based assignments and assessments.
5. Monitor individual student growth with common local assessments employing multiple measures (including performance-based assessments used formatively).

For School

1. Engage in professional collaboration about identifying and/or developing performance-based assessments, scoring them consistently, and using the results to improve instruction and monitor student growth.
2. Identify and commit to the school-wide use of performance-based assignments and assessments throughout the curriculum and throughout the school year.
3. Identify the methods and criteria for monitoring the success of this strategy.
4. Clearly and visibly communicate within the school community the achievement of students on performance-based assignments and assessments.

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Accelerating Acquisition of Basic Reading Skills: Elementary and Middle School

Center on Instruction

Research and expert opinion suggest that it is important to build basic or foundational reading skills in students who need them, while also providing them with access to grade-level concepts and content. The Response to Intervention (RTI) framework provides one method for accelerating student achievement in various content areas, including foundational skills in reading. In an RTI framework, students receive daily help learning not only so-called “basic skills” (e.g., decoding common words) but also higher order skills, such as comprehension, and grasping critical content in the disciplines. For more information about essential reading components, see the National Reading Panel Report (NICHD, 2000).

Attempts to develop foundational skills require school-wide commitment. Classroom teachers can provide differentiated instruction, create learning situations where heterogeneous pairs of students work together to build foundational skills, and provide sensible accommodations to ensure that all students, including English language learners and those with disabilities, receive meaningful access to the core grade level curricula content. A wide array of school personnel needs to ensure that the school conducts universal screening in reading, monitors progress of students identified as at-risk on a regular basis, and ensures that teachers are prepared to teach higher order skills by providing professional development when needed.

Action Principles

For District

1. Provide ongoing support and mentoring for schools as they expand RTI programs in reading (Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008).
2. Create a syllabus or curriculum guide and accompanying professional development for teaching literacy skills to adolescents (Kamil, Borman, Dole, Kral, Salinger, & Torgesen, 2008; Boardman, Roberts, Vaughn, Wexler, Murray, & Kosanovich, 2008).
3. Analyze district-wide data to identify schools that appear to be consistently building foundational skills in reading in low-performing students. Examine their programs and use principles learned and personnel from those schools to provide mentoring to others (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).

For School

1. Implement and expand Response to Intervention models in reading across all grade levels when feasible. In many cases, an RTI program will be established in K-3 reading, but often it should be expanded into higher grade levels as well (Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008; Glover & Vaughn, 2010).
2. Establish courses in adolescent literacy in middle school. Ensure that courses include not only work on decoding for those students who need it, but also contain a strong emphasis on vocabulary and comprehension (listening as well as reading) (Kamil, Borman, Dole, Kral, Salinger, & Torgesen, 2008; Boardman, Roberts, Vaughn, Wexler, Murray, & Kosanovich, 2008).
3. Use peer-assisted learning or class-wide peer tutoring in day-to-day classroom instruction in reading. Schedule these activities two or three times a week. They should never supplant instruction, but rather support time normally devoted to individual seatwork (Fuchs, Fuchs, Mathes, & Simmons, 1997).
4. Use differentiated instruction for part of reading lessons. Use formative assessment data to determine which students require help in foundational reading skills (Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007; Tomlinson & McTighe, 2006).

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Accelerating Acquisition of Basic Mathematics Skills: Elementary and Middle School

Center on Instruction

An emerging consensus of research and expert opinion is that it is important to build the basic or foundational skills in mathematics of all students who need them, while also providing them with access to grade level concepts and content. Response to Intervention (RTI) models provide an excellent venue for accelerating achievement in foundational skills and proficiencies. In an RTI model, students receive daily help learning not only so-called “basic skills” (e.g., mathematics facts and computation) but also higher order skills, such as problem solving, and the critical content in the discipline. For information about what experts suggest as the critical content in mathematics, see the National Council of Teachers of Mathematics (NCTM) Curriculum Focal Points (National Council of Teachers of Mathematics, 2006) and the report of the National Mathematics Advisory Panel (2008).

Developing foundational skills in students who lack them requires school-wide commitment. It requires that classroom teachers provide differentiated instruction, create learning situations where heterogeneous pairs of students work together to build foundational skills, and provide sensible accommodations to ensure that all students, including those with disabilities and English language learners, receive meaningful access to the core grade-level curricula content. A leadership team consisting of at least two people (including school psychologists, special educators, teachers, and possibly the principal) needs to ensure that the school conducts universal screening in mathematics, monitors the progress of identified students on a regular basis, and prepares teachers to teach higher order mathematics skills through high-quality professional development.

Action Principles

For District

1. Provide ongoing support and mentoring for schools as they expand RTI programs in mathematics (Gersten, Beckmann, Clarke, Foegen, Marsh, Star, & Witzel, 2009; Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008).
2. Create a syllabus or curriculum guide that can be used district-wide for double dose mathematics courses (Kamil, Borman, Dole, Kral, Salinger, & Torgesen, 2008; Boardman, Roberts, Vaughn, S., Wexler, Murray, & Kosanovich, 2008; Nomi & Allensworth, 2009).
3. Analyze district-wide data to identify schools that appear to be consistently building foundational skills in mathematics in low-performing students. Examine their programs and use principles learned and personnel from those schools to provide mentoring to others (Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009).

For School

1. Implement Response to Intervention models in mathematics, when feasible. In mathematics, beginning at only one grade range (e.g., grades 6-8 for algebra readiness or K-3 for early preventative work) is recommended (Gersten, Beckmann, Clarke, Foegen, Marsh, Star, & Witzel, 2009; Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, & Tilly, 2008; Glover & Vaughn, 2010).
2. Establish double dose courses in middle school for students who are taking pre-algebra or other challenging, grade-level mathematics courses but lack foundational skills. Create coordination between these courses and the regular grade-level courses. For example, if the grade-level course is focusing on proportional reasoning, a key component in the double dose or foundational course should be fractions (concepts and operations), so students can succeed in grade-level mathematics courses while building foundational skills (Nomi & Allensworth, 2009).

3. Use peer-assisted learning or class-wide peer tutoring in day-to-day classroom instruction in mathematics. Schedule these activities two or three times a week. These should never supplant instruction, but rather support time normally devoted to individual seatwork (Fuchs, Fuchs, Mathes, & Simmons, 1997).
4. Use differentiated instruction for part of mathematics lessons. Use formative assessment data to determine which students require help in foundational mathematics competencies (Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007; Tomlinson & McTighe, 2006).

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Accelerating Instruction in Reading: Grades 9-12

National High School Center

Many high school students are below grade level in reading. While the extent of the problem depends on the standard that is used, there is agreement that a substantial segment of high school students are behind (Balfanz, McPartland, & Shaw, 2002). Students needing reading remediation are not evenly dispersed among schools and population subgroups. High poverty schools have a higher rate of students who cannot read at the high school level. In addition, specific groups of students have a higher occurrence of reading deficiencies. For example, students with learning disabilities may enter high school reading on an elementary level (Bremer, Clapper, & Deshler, 2002). The increased enrollment of English language learners has also contributed to a wider gap in reading achievement (Comprehensive School Reform Quality Center, 2005).

All students can benefit from comprehensive interventions embedding literacy strategies into content area classes. High school students struggling with reading need targeted supplemental interventions in order to help accelerate their basic reading levels (for examples, see What Works Clearinghouse, n.d.). Often, students who have difficulty reading in high school face struggles in content-area courses that assume grade-level reading (Bremer, Clapper, & Deshler, 2002). The texts with which students interact in high school become longer and more complex, and the specific disciplinary skills required to interact with those texts become more demanding in high school. At the same time, students' reading challenges also can accumulate as they progress, making the task of identifying the specific nature of students' difficulties and appropriate interventions more challenging.

A number of recent reports point to the challenges of advancing adolescent literacy (Biancarosa & Snow, 2004; Carnegie Corporation, 2010; Graham & Perin, 2007). The following section highlights specific action principles at the state, district, and school levels and provides selected resources that include strategies which might be useful for supporting literacy instruction in high schools.

Action Principles

For State

1. Create a task force or statewide initiative focused on adolescent literacy that would include representatives from various divisions of the state education agency (curriculum, teacher certification, assessment, high school office staff, etc.), institutes of higher education that have teacher pre-service training programs, district staff, and teachers (including high school content area teachers).
2. Design policy structures and supports to drive local implementation of district- and school-wide literacy plans.
3. Consider embedding content area literacy strategies into the certification and recertification process for high school teachers.
4. Create a certification process for high school literacy coaches.

For District and School

1. Develop and support expertise in content area literacy strategies.
2. Screen all high school students for reading achievement levels and provide appropriate interventions to help those several grade levels behind.
3. Provide ongoing, job-embedded professional development on content area literacy strategies for all content area staff.
4. Make instructional and structural changes in the high school that support interventions for struggling readers and literacy strategies (e.g. tiered interventions, extended learning time).
5. Implement, with fidelity, reading intervention programs for students who need additional support with reading.

Annotated State High School Reading Resources

- Bacevich, A. & Salinger, T. (2006): This report provides five recommendations for states and districts based on a study of the Alabama Reading Initiative: begin with a flexible model that reflects a broad research base that can be responsive to the needs of students, content areas, and local conditions; use explicit strategies to increase comprehension across content areas; identify and intervene as early as possible with students who are most at risk; ensure leadership development; and be creative and vigilant with local and external funding.
- Carnegie Council on Advancing Adolescent Literacy. (2010): The Carnegie Council on Advancing Adolescent Literacy has recently released a series of reports that provide research and specific recommendations designed to tackle adolescent literacy. The first of those, *A Time to Act: An Agenda for Advancing Adolescent Literacy for College and Career Success*, contains a chapter with priority action steps for school leaders, district leaders, state leaders, and federal policymakers.
- Haynes, M., & Levin, J. (2009): This report outlines the actions in five states where leaders have made significant gains in adolescent literacy. Those actions include: adopting comprehensive literacy plans that connect reading, writing, speaking, listening, and thinking and integrate literacy instruction within subject areas; strengthening teacher licensure and preparation of teachers to provide research-based reading and writing throughout the curriculum; developing a continuum of supports and interventions for struggling readers and designing policy structures and supports to drive local implementation of district- and school-wide literacy plans.
- National Association of State Boards of Education. (2006): This report recommends that every state “develop and vigorously implement a statewide literacy plan to ensure that all students can read proficiently.” It provides a checklist for states that includes laying the ground work for a focus on adolescent literacy, establishing a state framework, and ensuring that teachers have the knowledge and support to provide literacy instruction.
- Southern Regional Education Board. (2009): Leaders from the Southern Regional Education Board states consulted with experts and examined state practices to generate a list of recommended state actions: define specific reading skills students need to master key subjects; identify the best teaching strategies to help students develop comprehension skills in each subject; ensure these strategies are applied statewide by including them in professional development for current teachers and in preparation programs for new teachers; and provide support that struggling readers need.

Annotated District and School High School Reading Resources

- Torgesen, J. K., Houston, D. D., Rissman, L. M., Decker, S. M., et al. (2007): This piece provides research-based evidence and endorses specific interventions for students who are reading below grade level and those who are English language learners (ELLs). The publication describes six areas that are essential for reading and thinking skills in grades 4-12: reading fluency, vocabulary knowledge, content knowledge, higher-level reasoning and thinking skills, cognitive strategies specific to reading comprehension, and motivation and engagement.
- Scammacca, N., et al. (2007): This report, commissioned by the Center on Instruction, offers decision-makers research-based information about interventions that can help older students who continue to struggle with reading. This report provides research-based implications for practice.
- Biancarosa, G. & Snow, C. (2004): This document, which was supported by Carnegie Corporation of New York, outlines 15 key components of comprehensive literacy programs, essentially providing a checklist for schools and districts that wanted to improve their services for adolescent struggling readers. The fifteen components are: direct, explicit instruction; effective instructional principles embedded in the content; motivation and self-directed learning; text-based collaborative learning; strategic tutoring; diverse texts; intensive writing; technology components; ongoing formative assessments; extended time for literacy; professional development; ongoing summative assessments of students and programs; teacher teams; leadership; and comprehensive and coordinated literacy program.

- Kamil, M., et al. (2008): The Institute of Education Sciences (IES) commissioned a practice guide designed to bring the best possible evidence to the challenge of improving adolescent literacy. This report describes five recommendations for instruction as well as the strength of evidence to support each: provide explicit vocabulary instruction; provide direct and explicit comprehension strategy instruction; provide opportunities for extended discussion of text meaning and interpretation; increase student motivation and engagement in literacy learning; and make available intensive and individualized interventions for struggling readers that can be provided by trained specialists.

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Accelerating Instruction in Mathematics: Grades 9-12

National High School Center

Taking advanced mathematics in high school has been found to be strongly associated with postsecondary success (Adelman, 1999). Algebra I is viewed as the “gatekeeper course,” and successful completion paves the way for students to advance to higher level mathematics coursework that will help to prepare them for post-secondary career and college opportunities (Bangser, 2008). Unfortunately, a large number of students enter high school with poor math skills (Strickland & Walters, 2009) and are not prepared to successfully complete an algebra course. Without the proper assistance, the likelihood of these students participating in a rigorous math course sequence is greatly reduced.

Accelerating instruction in math helps to address the issue by moving away from the more traditional model of remediation that, in most cases, keeps students on low academic tracks that some believe contribute to their persistent low achievement. The underlying premise of accelerated instruction is that all students should have the opportunity to enroll in rigorous mathematics coursework. Therefore, instead of slowing down the instructional pace for low-achieving students, instruction is accelerated to help these students overcome prior poor educational preparation and “catch up.” With accelerated instruction, students learn foundational math skills as well as higher level mathematics content. As a result, they remain on-track to take more advanced mathematics courses.

Accelerating mathematics instruction is especially important to provide foundational skills necessary for mastery of other content areas. Within the context of accelerating instruction, educators must consider the quality and nature of instruction provided. Accelerated instruction must be based on a well-designed curriculum taught by qualified instructors. Implementing this strategy also calls for smaller classes, differentiation of instruction, and the use of multiple instructional modalities such as computer-based programs, hands-on activities, group and independent activities to better address diverse student needs (Portz & Gaudet, 2001).

Although the research evidence on the needs of students who enter high school with inadequate mathematics skills is minimal, schools can employ several promising strategies to accelerate instruction. These include the following:

Double-blocked class schedules: With a double-blocked class schedule, classes meet daily for extended periods and can cover a year’s worth of material in one semester. This gives students the opportunity to attempt and earn more credits per year than more traditional schedules such as daily 50-minute classes or a single-blocked schedule with 80- or 90-minute classes meeting every other day (Herlihy & Quint, 2006).

Catch-up courses: Semester-long intensive “catch-up” courses that strengthen ninth-grade students’ skills in reading and mathematics appear to help students succeed in the regular curriculum, with gains in credits earned being sustained over time. These courses are designed to prepare students for more rigorous college preparatory classes such as English I and Algebra I (Herlihy & Quint, 2006).

Mathematics support pull-out programs: This involves pulling students out of their regular classes for participation in more specialized instruction tailored to their academic needs (Portz & Gaudet, 2001).

For more information on these strategies, please reference the section on “Credit Recovery Programs” in Chapter 5 of this *Handbook*.

Action Principles

For District

1. Provide guidelines on how to offer accelerated mathematics programs.
2. Provide oversight and support for instructional initiatives aimed at accelerating instruction to help ensure adherence to guidelines and effective implementation.

3. Provide criteria for assessing student skill deficits and identifying which students need accelerated instruction.
4. Provide standards and assessments for monitoring instruction and student learning.
5. Provide teachers with ongoing support for and professional development on implementing accelerated instruction.
6. Track the progress of school efforts and student achievement to help identify effective practices and establish a system of accountability.

For School

1. Use standards and assessment data to help plan and/or improve the math curriculum and ensure that it is tailored to students' needs.
2. Develop early warning systems to identify students in need of extra math instruction when they enter high school.
3. Administer a diagnostic assessment at the beginning of the school year to identify specific math skill and content weaknesses and use this information as the foundation for students' curricular and instructional planning.
4. Make teacher assignments based on the needs of students; an assessment of teacher strengths and weaknesses should guide these decisions. Teachers should have adequate mathematics content knowledge as well as the skills to work with struggling students. Provide teachers with professional development and support in issues related to curriculum and instruction (including model lesson plans and opportunities to engage with master teachers).
5. Develop guidelines to monitor and ensure the efficient use of class time, student engagement, and the use of a range of instructional strategies.

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Providing Advanced Coursework in High Schools

National High School Center

The availability of and participation in Advanced Placement and International Baccalaureate programs and advanced courses in science, technology, engineering, and mathematics (STEM) disciplines are integral to preparing high school students for college and the workforce. Students are more likely to stay in school (Archambault, Janosz, Morizot, & Pagani, 2009) and perform at high levels (Cole, Kennedy, & Ben-Avie, 2009) if they are engaged with a challenging curriculum that helps them develop the college- and career-ready skills they need to succeed after high school.

Advanced Placement (AP) programs are designed to provide students with college-level courses and exams. Many colleges throughout the nation reward students who score a 3 or higher on Advanced Placement tests with college credit or access to higher level college courses. Research shows that students who take the AP course and the AP exam earn higher GPAs and more credits in college and are more likely to graduate from college than students who took only the AP course or a non-AP course in the same subject (e.g., Hargrove, Godin, & Dodd, 2008; Dougherty, Mellor, & Jian, 2006).

In recent years the number of students taking Advanced Placement courses has increased (College Board, 2009). The largest gains in Advanced Placement course taking are among groups of students previously underrepresented in these courses, with minority participation having increased by 106% between 2007 and 2008 (Wakelyn, 2009). However, despite these gains, African American, Hispanic, and American Indian students are still underrepresented in Advanced Placement courses.

The *International Baccalaureate (IB)* program is designed as an academically challenging two-year program for highly motivated juniors and seniors that prepares them for success in college and beyond. Recognized across the world as a demanding high school curriculum, the IB program includes a set of rigorous written and oral examinations that culminates in an IB diploma. Over the past decade, the number of IB programs in North America grew from 227 to 624, increasing by about 10% annually, and the program continues to expand into urban high schools throughout the nation (Byrd et. al., 2007).

Like AP students, those who participate in an IB program enjoy significant advantages for college admittance and have greater success in postsecondary settings than their non-IB peers (International Baccalaureate Organization, 2007). Furthermore, research suggests that an IB program can help urban schools attract and retain African American, Hispanic, and American Indian students, as well as students from disadvantaged backgrounds (Mayer, 2008).

Science, Technology, Engineering, and Mathematics (STEM). Both AP and IB, along with other programs, provide students with rigorous, challenging courses in core subjects, including advanced science and mathematics. As changes in the global economy call for a diverse cadre of innovators in STEM fields, a dwindling number of students in the United States are entering these fields. Moreover, American high schools are failing to equip their graduates with the knowledge and skills they need to excel in STEM fields in college and in the workforce (Seymour & Hewitt 1997; Taningco, Mathew, & Pachon, 2008).

Many states, districts, and schools are implementing programs designed to expose all students to a rigorous STEM curriculum and keep students—particularly underrepresented minority and female students—in the STEM “pipeline” through and beyond college. High quality curriculum and instruction, supported with ongoing professional development for STEM teachers, are keys to ensuring that students graduate with the skills they need to excel in the high-demand STEM fields (Leinwand, 2008). Furthermore, schools and districts that partner with the local scientific and business communities, as well as with institutions of higher education, can focus their resources to enhance STEM learning opportunities (Coppola & Malyn-Smith, 2006) and provide hands-on work-based opportunities for students to explore STEM in the real world.

Action Principles

For State

1. Develop a STEM task force and a statewide strategic action plan for accelerating education in STEM disciplines.
2. Seek federal and private grant funding to enhance STEM education.
3. Provide incentives for districts to partner with local institutions of higher education and the business and scientific communities to enhance STEM education.
4. Dounay (2006) offers additional action principles for states.

For District

1. Ensure that all students have access to advanced coursework. For example, provide online programs for students who attend rural schools that have limited ability to offer advanced courses.
2. Develop strategies to increase enrollment of students who are underrepresented in advanced courses. Maintain records on enrollment in advanced coursework, disaggregated by school and subgroup. Use these data to track underrepresented students' enrollment patterns in advanced courses.
3. Provide teachers with the appropriate training and professional development to deliver advanced instruction.
4. Engage local institutions of higher education, STEM industry members, and other agencies in enhancing STEM education programs.
5. Apply for a grant from the National Science Foundation (NSF) to enhance STEM education. Partner with local institutions of higher education to develop and implement comprehensive K-20 STEM programs that specifically target minority and female students.

For School

1. Develop strategies and provide appropriate supports to increase access to, enrollment in, and completion of advanced courses for groups of students who historically have not been given the opportunity to participate.
2. Design needed support systems.
3. Support teachers of AP, IB, and other advanced courses who pursue professional development.
4. Foster student engagement in STEM learning through hands-on and inquiry-based opportunities.
5. Provide financial assistance for test fees to low-income students.
6. Provide opportunities for interdisciplinary teaming among teachers, so that, for example, science and reading teachers can collaborate to design course modules for students.
7. Implement innovative school structures to encourage STEM enrollment, including ninth grade academies, catch-up courses, and extended learning time.

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Implementing Competency-Based Instruction in High Schools

National High School Center

Since 1908, Carnegie Units have been the primary means of determining course completion credit and graduation eligibility in the nation's high schools. In brief, a Carnegie Unit represents how many "contact hours" or how much "seat time" a student has devoted to the study of a particular school subject (usually 120 hours per credit). Competency-based instruction provides an alternative to the Carnegie Unit system by focusing on the mastery of a set of specific competencies or skills that encompass the course content. Students in competency-based courses must demonstrate and apply what they have learned by performing real-world tasks (Wiggins, 1990). Through an outcome-focused approach, competency-based instruction in high school enables and supports the following:

- *Flexibility*: Students can shorten the time needed to meet graduation requirements (e.g., by placing out of a course or mastering the required skills in a reduced timeframe) and take advantage of extra-curricular learning opportunities such as interdisciplinary and independent studies, dual enrollment programs, and internships;
- *Multiple assessments*: Educators can look to multiple measures of what students actually know and can do rather than rely solely on large-scale, standardized, norm-referenced achievement tests that are predominantly multiple-choice (Schmoker, 2008; 2009); and
- *Responsiveness to individual student needs*: Competency-based instruction allows English language learners (Gomez, 1998) and special education students (Venn, 2000) alternative mechanisms to demonstrate their proficiency in a content area.

Most state policies permit students to earn proficiency or competency-based credit whether by completing an activity that demonstrates mastery of the required content from a list of approved activities or case-by-case upon approval by a local school board or superintendent. One of the more common mechanisms for demonstrating competency-based mastery is performance assessments (Marzano et al., 1993; Wiggins, 1998), which include projects and portfolios such as those used in Michigan, New York, and Maine. Project-based learning (PBL) is a type of competency based instruction that engages students in meaningful and relevant work and builds on student interests. PBL is characterized by extended student inquiry activities; deep study over a breadth of topics; some degree of self-directed learning; and a presentation of findings, results, or conclusions (Ravitz, 2008).

Portfolios are another strategy used in competency-based instruction to showcase and document student work as exemplars of achievement and/or progress towards achieving learning standards (Gomez, 1998). Additional competency-based instructional approaches currently in use by states include courses offered at occupational centers, postsecondary institutions, and technical training programs; community service, internship and externship activities that are monitored or structured by the school; foreign exchange programs or demonstrated fluency in a foreign language or American Sign Language; private instruction; distance learning opportunities; and artistic performances and visual art demonstrations and exhibitions (Education Commission of the States, 2006; Lloyd, 2007).

Action Principles

For State

1. Provide assessments for all core courses in line with state standards that students can take to earn credit. These exams should emphasize authentic and challenging content and skills, be validated as accurate predictors of postsecondary performance, and should be aligned with postsecondary school systems (e.g., California, Washington, New York), as well as 21st century knowledge and skills (Achieve, 2004a; 2004b).
2. Provide resources and expertise to districts to support professional development on effective performance assessment.

For District

1. Develop resources (e.g., rubrics, content- and grade-specific models and exemplars) to support implementation of performance assessment at the school level.
2. Provide professional development in effective performance assessment in the subject areas.

For School

1. Develop and implement mechanisms (e.g., policies, procedures, guidelines, checklists, portfolio rubrics, block scheduling, student advisories, career academies) for structuring, monitoring, documenting, and evaluating students' out-of-school and extra-curricular learning experiences.

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