Differentiating Instruction in Response to Student Readiness, Interest, and Learning Profile in Academically Diverse Classrooms: A Review of Literature

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Both the current school reform and standards movements call for enhanced quality of instruction for all learners. Recent emphases on heterogeneity, special education inclusion, and reduction in out-of-class services for gifted learners, combined with escalations in cultural diversity in classrooms, make the challenge of serving academically diverse learners in regular classrooms seem an inevitable part of a teacher's role. Nonetheless, indications are that most teachers make few proactive modifications based on learner variance. This review of literature examines a need for "differentiated" or academically responsive instruction. It provides support in theory and research for differentiating instruction based on a model of addressing student readiness, interest, and learning profile for a broad range of learners in mixed-ability classroom settings.

Introduction: A Rationale for Differentiating Instruction

Today's classrooms are typified by academic diversity (Darling-Hammond, Wise, & Klein, 1999; Meier, 1995). Seated side by side in classrooms that still harbor a myth of "homogeneity by virtue of chronological age" are students with identified learning problems;

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highly advanced learners; students whose first language is not English; students who underachieve for a complex array of reasons; students from broadly diverse cultures, economic backgrounds, or both; students of both genders; motivated and unmotivated students; students who fit two or three of these categories; students who fall closer to the template of grade-level expectations and norms; and students of widely varying interests and preferred modes of learning. By 2035, students of color will be a majority in our schools, with increasing populations of children of immigrant and migrant families expanding the presence of cultural diversity in schools. Half of all children will live in single-parent homes at some time during their school years (Sapon-Shevin, 2000/2001).

These demographic realities are intensified by (a) an emphasis on detracking to promote educational equity for students who might otherwise find themselves schooled in low-expectations environments, (b) an emphasis on mainstreaming of students with special education needs, (c) a reduction of special programs for gifted learners (Lou et al., 1996; Sapon-Shevin, 2000/2001), and (d) intent to reduce segregation of students with reading problems and to enhance literacy instruction in the regular classroom for all learners (Allington, 2003). Such evolutions leave teachers with the need to address learner variance in the regular classroom, rather than through organizational arrangements (Jackson & Davis, 2000; Stradling & Saunders, 1993) that have often served to relieve the classroom teacher of primary responsibility for attending to the needs of students who diverge markedly from the norm. Thus, throughout the literature of the current school reform movement is a call for teachers to adjust curriculum, materials, and support to ensure that each student has equity of access to high-quality learning (Darling-Hammond et al., 1999; Ducette, Sewell, & Shapiro, 1996; Gamoran & Weinstein, 1995; Schoenfeld, 1999).

While heterogeneous instruction is attractive because it addresses equity of opportunity for a broad range of learners, mixed-ability classrooms are likely to fall short of their promise unless teachers address the learner variance such contexts imply (Gamoran & Weinstein, 1995). In such settings, equality of opportunity becomes a reality only when students receive instruction suited to their varied readiness levels, interests, and learning preferences, thus enabling them to maximize the opportunity for growth (McLaughlin & Talbert, 1993).

Even when special pull-out services, such as reading, English as a second language, gifted education, or special education, *are* available for identified students, it is likely that most of these learners will still spend the bulk of their school careers in regular class-

rooms. Further, even in more "homogeneous" settings, such as special education resource rooms, honors classes, and language resource rooms, it is evident that the range of student experience, competence, and motivation makes these settings far less homogeneous than their labels imply (Gamoran & Weinstein, 1995).

It is a reasonable hypothesis that a current interest in what is called "differentiated instruction" is due to a degree of academic diversity that teachers simply can no longer ignore. If, indeed, it is the goal of the teacher to ensure that every student learns effectively and with a sense of satisfaction, this mosaic of students presents teachers with complex and difficult pedagogical dilemmas (Lou et al., 1996). Nonetheless, it would seem inevitable that today's schools reflect the reality that society is transforming itself; to respond appropriately, classrooms must be places where rigorous intellectual requirements characterize the curriculum, each student is known well and taught with appropriate means, each student learns well, and fidelity to individuals and community is a hallmark (Mehlinger, 1995). It may be that educators no longer have a legitimate choice about *whether* to respond to the academically diverse populations in most classrooms; rather, they can only decide *how* to respond (Sizer, 1985; Stradling & Saunders, 1993).

As a transformation in society and schools evolves, effective teachers in contemporary classrooms will have to learn to develop classroom routines that attend to, rather than ignore, learner variance in readiness, interest, and learning profile. Such routines may be referred to as "differentiating" curriculum and instruction. Differentiation is a pedagogical, rather than an organizational, approach (Stradling & Saunders, 1993). One way of conceiving differentiation is modification of teaching and learning routines to address a broad range of learners' readiness levels, interests, and modes of learning (Tomlinson, 1999, 2001). Differentiation can be defined as an approach to teaching in which teachers proactively modify curricula, teaching methods, resources, learning activities, and student products to address the diverse needs of individual students and small groups of students to maximize the learning opportunity for each student in a classroom (Bearne, 1996; Tomlinson, 1999).

Current State of the Art With Learner Variance

Both the relative newness of the critical mass of diverse learners in regular classrooms and the complexity of a teacher's role in

addressing their needs are underscored by research suggesting that most teachers still do little to adjust their instruction in ways that effectively reach out to academically diverse populations. Studies vary in reports of the importance that teachers place on attending to academic diversity in classrooms.

A survey of high school teachers (Hootstein, 1998) found 90% responding that addressing academic differences is important or very important. By contrast, 50% of respondents to a nationwide survey of middle school teachers said they did not differentiate instruction based on readiness, interest, or learning profile because they saw no need to do so (Moon, Tomlinson, & Callahan, 1995). General education teachers may also reject adapting instruction for individual learner needs because they feel doing so calls attention to student differences (Schumm & Vaughn, 1995); they feel it is not their job to do so (Schumm & Vaughn, 1995); they are unaware of learner needs (Schumm & Vaughn, 1992, 1995); they believe special treatment is poor preparation for a tough world that does not provide special treatment (Schumm & Vaughn, 1995); or, in the case of advanced learners, because teachers do not feel students need adaptations (Tomlinson, 1995) because teachers do not know how to modify the curriculum for students whose proficiencies extend beyond those prescribed by grade-level curricula, standards documents, or both (Callahan, Tomlinson, Moon, Brighton, & Hertberg, 2003; Hertberg, 2003). It appears that teachers are more likely to find adaptations for learner variance to be more desirable than feasible (Schumm & Vaughn, 1991). Even when teachers express support for inclusive classrooms, they are likely to plan for whole-class instruction (Morocco, Riley, Gordon, & Howard, 1996).

When teachers *have* attempted differentiation, it has often been used in ways that are limited and ineffective (Schumm et al., 1995; Stradling & Saunders, 1993). Modifications are likely to be improvisational or reactive, rather than preplanned or proactive (Hootstein, 1998; McIntosh, Vaughn, Schumm, Haager, & Lee, 1994; Schumm & Vaughn, 1992, 1995; Tomlinson, 1995). Teachers seem particularly resistant to adapting or modifying materials, planning lessons for individuals, and changing evaluation procedures (Johnsen, Haensly, Ryser, & Ford, 2002; Schumm & Vaughn, 1995; Vaughn & Schumm, 1994). Appropriate response to learner variance is also impeded by instruction in which understanding is sacrificed to coverage and where teachers have not identified key concepts, ideas, and skills that would serve as a solid framework for modifications (Schumm & Vaughn, 1995; Tomlinson, Callahan, Tomchin, et al., 1997; Vaughn & Schumm, 1994). High-stakes test-

ing likely exacerbates this problem (Callahan et al., 2003; Vaughn & Schumm, 1994).

These sorts of shortfalls are evident whether students' differences result from learning problems, advanced learning, second language, or cultural variance. For example, while teachers appear willing to accept learners with mild disabilities into their classrooms, treating them fairly and impartially (McIntosh et al., 1994; Schumm & Vaughn, 1995), adjustments teachers make for these students amount to little more than providing reinforcement and establishing rapport with the students (Schumm & Vaughn, 1991)—or reducing expectations (Deno, 1994; Fuchs & Fuchs, 1998). Teachers are unlikely to accept strategies that require them to modify materials, change instructional practices, make long-range plans, or adapt scoring and grading criteria (McIntosh et al.). The students are included in whole-class activities, but participate only to a very limited degree. The students do not receive what could be called meaningfully differentiated instruction (McIntosh et al.).

Similarly, both survey (Archambault et al., 1993) and observational (Westberg, Archambault, Dobyns, & Salvin, 1993) studies of students identified as gifted suggest that teachers made only minor modifications in their curriculum or instruction to address the advanced learning needs of these learners in the regular classroom. In fact, gifted students received no differentiation in 84% of the learning activities in which they engaged (Reis et al., 1993).

In one study, a third of struggling learners in Scottish classrooms that were purportedly responding to student variance spent about a third of their time working on tasks that were too difficult and with insufficient practice time for them to become comfortable with prescribed skills (Simpson & Ure, 1994). Two additional studies of classrooms in the United Kingdom where teachers were reported to be better than average with differentiation consistently found advanced learners occupied with practice of skills in which they were already competent and struggling learners working on tasks beyond their grasp (Bennett, Desforges, Cockburn, & Wilkinson, 1984; Simpson, 1997).

Continuing the pattern, many teachers are unaware of or inattentive to ways in which culture (Delpit, 1995; Lasley & Matczynski, 1997) and race (Perry, Steele, & Hilliard et al., 2003) can impact attitudes about school and learning-profile preferences—a reality that often leads to both the academic and socioemotional detriment of these learners. Further, teachers often conclude that students who do not develop early proficiency with reading and computation are

deficient in ability (Tomlinson, Callahan, & Lelli, 1997) and generally do not help students from nondominant cultures build the skills necessary for success in or out of school (Burstein & Cabello, 1989; Delpit, 1995; Lasley & Matczynski, 1997).

Not surprisingly, studies find that students who have both identified learning disabilities and English as a second language are in a double bind. Even in special bilingual classes, where one might assume sensitivity to student learning needs, differentiation for students with learning disabilities was not evident. These students were taught using whole-group instruction, the same classroom activities as all other students, and with the same materials and assignments. They also interacted less in class, asked for help more frequently, and exhibited more frustration and confusion than other students. While teachers were aware that the work was difficult for students with both language and learning needs, they did not differentiate instruction except to take into account the quality or amount of student work (Fletcher, Bos, & Johnson, 1999; Minner, 1990; Reis, Neu, & McGuire, 1997).

Similarly, students dually identified as both gifted and having some sort of disability find school environments poorly equipped to meet their dual learning needs. Indications are that these students are less likely to be perceived as highly able than nonhandicapped peers of similar ability (Minner, 1990) or to be negatively perceived by their teachers (Reis et al., 1997). When learning *is* modified in response to these double-labeled learners, teacher emphasis is far more likely to be placed on student deficits than strengths (Whitmore & Maker, 1985).

In general, it appears that both preservice teachers (Paine, 1990; Tomlinson, Callahan, Tomchin et al., 1997) and in-service teachers (Tomlinson, Callahan, & Lelli, 1997) view differences as problematic, rather than as an inevitable phenomenon that offers positive possibilities for teachers and students alike. Further, when teachers see differences as deficits in students, rather than as classroom characteristics, this may lead teachers to relinquish responsibility for the academic success of each learner (Paine, 1990).

In cases where teachers use instructional approaches designed to tap student interest, it appears that student interests may take a backseat to what interests the teacher (Moon et al., 1995). In such instances, opportunity to use interest-linked motivation is likely sacrificed.

While many teachers acknowledge academic diversity in their classrooms and often affirm the need to address student variance, their practice tends to be misaligned with those beliefs:

> Most teachers teach every child the same material in the same way, and measure each child's performance by the same standards. This approach seems fair somehow: no child is given special treatment or unfair advantage. Thus, teachers embrace the value of treating each child as a unique individual while instructing children as if they were virtually identical. [However,] many teachers would eagerly embrace a vision that would permit them to merge their practice with their values. (Mehlinger, 1995, p. 4)

What is "broken" in classrooms for academically diverse student populations is likely systemic. Patterns of inattention to student variance are evident in literature related specifically to numerous learner exceptionalities, such as giftedness, special education, second language acquisition, multicultural learners, and students from low economic backgrounds. Patterns in these various literatures suggest the problems lie in beliefs and practices related to teaching, learning, and the nature of young people as learners—in other words, beliefs and practices related to "how we do school." Unless we understand and address the systemic issues, it appears unlikely that *any* students with learning needs shaped by readiness, interest, or learning profile will be well served on a consistent basis in today's schools. If contemporary classrooms are to serve contemporary student populations effectively, there is a need for investigating and addressing pervasive teacher beliefs, as those beliefs impact teacher awareness of student variance and the curriculum and instruction teachers plan and deliver to diverse learners. Such a "big picture" approach may well be a precursor to addressing effectively the particular learning needs of specific learners and populations of learners.

To facilitate both research and staff development on effective teaching of academically diverse student populations, it is important to search current educational literature for insights that begin to address two key questions. First, what reasons do we have to assume that instruction responsive to student readiness, interest, or learning profile could result in more appropriate learning experiences and outcomes for academically diverse populations? Second, what would be the hallmarks of appropriately differentiated instruction? This review draws on the literature of theory and research to provide some answers to each of the questions—with the goal of clarifying directions necessary to change the current inability of many classrooms to attend to the learning needs of many students who invest time there daily. The section that follows examines theory and research that provide a basis for differ-

entiating curriculum and instruction in response to student readiness, interest, and learning profile.

Support for Differentiation in Theory and Research

Beyond experiential evidence that pervasive uniformity in teaching fails many learners, there is reason in both theory and research to support movement toward classrooms attentive to student variance that is manifest in at least three areas: student readiness, interest, and learning profile (Tomlinson, 2001). It is useful to establish both definitions and grounding in the literature of education for these three elements.

Differentiation of Curriculum and Instruction as a Response to Student Readiness

In regard to readiness for a given task, Vygotsky (1978, 1986) proposed that an individual learns in his or her "zone of proximal development" (ZPD). This term refers to a point of required mastery where a child cannot successfully function alone, but can succeed with scaffolding or support. In that range, new learning will take place. The teacher's job is to push the child into his or her zone of proximal development, coach for success with a task slightly more complex than the child can manage alone, and, thus, push forward the area of independence. It is through repetition of such cycles that learners grasp new ideas, master new skills, and become increasingly independent thinkers and problem solvers. Current brain research (Howard, 1994; Jensen, 1998; Sousa, 2001; Wolfe, 2001) seems to reach a similar conclusion—that students should work at a level of "moderate challenge" for learning to occur. Further, when students encounter tasks at moderate levels of difficulty, they are also more likely to sustain efforts to learn, even in the face of difficulty, than when tasks are too difficult or underchallenging (Bransford, Brown, & Cocking, 2000; Csikszentmihalyi, Rathunde, & Whalen, 1993; Rohrkemper, 1990). Thus, theory related to learner readiness suggests that

> Instruction should always "be in advance" of a child's current level of mastery. That is, teachers should teach within a child's zone of proximal development. If material is presented at or below the mastery level, there will be no growth. If presented well above the zone, children will be confused and frustrated. (Byrnes, 1996, p. 33)

The approach of using single tasks for all learners of varying readiness levels with only occasional modifications probably falls short for many students because the task itself is outside their zones of proximal development, and minor modifications in the task do not correct the mismatch between task and learner. Research related to readiness gives substance to that conclusion.

In a review of research on multiage classes (differentiated by intent and necessity), Miller (1990) found achievement test results favoring multiage classrooms versus single-grade classrooms on 75% of the measures used, despite the fact that increased achievement test results are not generally the primary goal of multiage classes. Similarly, in an examination of research on nongraded classes, Gayfer (1991) looked at standardized test results available in 57 of 64 studies. In 58% of instances, students in nongraded setting scored higher achievement gains than students in graded settings. The two groups scored comparable achievement gains in 33% of instances, and achievement gains favored students in graded settings in 9% of cases. Further, studies indicate that students in these differentiated classrooms achieve better outcomes than students in classrooms with a more single-size approach to instruction in study habits, social interaction, cooperation, attitude toward school, and general mental health (Gayfer, 1991). It also appears that benefits to students in multiage or nongraded settings increase the longer students remain in those settings (Anderson & Pavan, 1993).

A complex and multifaceted qualitative study of adolescents and schooling suggested that, when academic tasks were poorly matched to students' readiness levels, impacts were negative. When students were asked to do tasks for which they did not have requisite skills, both their achievement and feelings of self-worth decreased. When students were asked to do tasks that were too simple for their skills level, they disengaged with the tasks (Csikszentmihalyi et al., 1993).

Two recent dissertation studies (Brimijoin, 2001; Tieso, 2002) reported achievement gains for students in effectively differentiated classrooms. In these instances, achievement gains were demonstrated across economic lines through pretest–posttest results (Tieso) and on a state standards test (Brimijoin).

"Challenges . . . must be at the proper level of difficulty in order to be and remain motivating: tasks that are too easy become boring; tasks that are too difficult cause frustration" (National Research Council, 1999, p. 49). This seems to be the essence of readiness differentiation for all learners—and a central challenge for teachers in contemporary schools.

*Differentiation of Curriculum and Instruction
as a Response to Student Interest*

Just as students vary in readiness to learn given content at a given time, they vary in interests, as well. As is the case with readiness, it appeared that addressing learner interest can be important to a student's academic development.

Interest-based study is linked to motivation and appears to promote positive impacts on learning in both the short and long term (Herbert, 1993; Renninger, 1990, 1998; Tobias, 1994). Modifying instruction to draw on student interest is also supported by theory and research as a means of enhancing motivation, productivity, and achievement (Amabile, 1996; Torrance, 1995). Questions and tasks that are interesting to students are more likely to lead to enhanced student engagement with the task, the student's sense that the work involved is rewarding, greater evidence of student creativity, increased student productivity, a higher degree of student autonomy, and a higher level of intrinsic motivation (Amabile, 1983; Brunner, 1961; Collins & Amabile, 1999; Sharan & Sharan, 1992).

In general, it appears that interest contributes to a sense of competence and self-determination in learners and to positive learning behaviors, such as willingness to accept challenge and persist in it (Csikszentmihalyi et al., 1993; Fulk & Montgomery-Grymes, 1994; Vallerand, Gagné, Senecal, & Pelletier, 1994; Zimmerman & Martinez-Pons, 1990). Allowing students to do something they love is likely to help them develop both a positive attitude about learning and their creative potential (Amabile, 1996; Runco & Chand, 1995; Torrance, 1995).

When highly able students enjoy cognitive tasks at an early age, they tend to continue seeking cognitive stimulation (Gottfried & Gottfried, 1996). Among this same group of learners, interest proves to be a catalyst for sustaining academic focus during adolescence (Csikszentmihalyi et al., 1993).

The concept of *flow* (Csikszentmihalyi et al., 1993) acknowledges the importance of interest in motivation. The term relates to a psychological state of complete involvement in an activity to the degree that time and fatigue disappear. Flow stems from interest, is highly satisfying, and may serve as a catalyst for developing new levels of skill in the interest area, particularly when the task at hand is just a bit in advance of the student's current skills level (suggesting a need to balance readiness and interest in school tasks). Studies have indicated that teachers are most effective in helping students find flow when they communicate high expectations with

clear standards, support student efforts, are passionate about their disciplines, and spend considerable time planning for student challenges that take advantage of students' interests and talents (Whalen, 1998).

Learners differ in general motivation to learning and response to specific learning tasks. Experts suggest, therefore, that students be encouraged to select their own topics for projects and to engage in discussions with parents and teachers about learning that brings them joy (Collins & Amabile, 1999; Wolfe, 2001). For instance, when students are encouraged to select reading material of interest to them, they are more likely to demonstrate substantive engagement and, thus, experience improved reading performance (Carbonaro & Gamoran, 2002). It may be particularly important to motivation and learning to promote situational or contextual interest (e.g., student choice, novelty, linkage with prior knowledge, certain text characteristics) when students do not have strong individual or personal interests (Hidi, 1990; Hidi & Anderson, 1992; Hidi & Berndorff, 1998; Wade & Adams, 1990).

The appropriate question in today's diverse classrooms is no longer "How can I motivate students?" Rather, it is "What motivates this particular student and how do I design work that is responsive to these motivations?" (Schlechty, 1997). Determining and designing tasks that tap the motivation of particular students is at the heart of interest-based differentiation.

Differentiation of Curriculum and Instruction
as a Response to Student Learning Profile

As it is beneficial to student learning for teachers to respond to their readiness levels and interests, it also appears beneficial to address student variance in learning profile. Learning profile attends to efficiency of learning (Tomlinson, 2003). The term *learning profile* refers to a student's preferred mode of learning that can be affected by a number of factors, including learning style, intelligence preference, gender, and culture.

Learning styles theory points to individual preferences related to categories, such as environment, emotions, interactions, and physical needs, suggesting that such factors as light, temperature, seating arrangements, demand for concentration, degree of learner mobility, time of day, and perceptual mode impact learning (e.g., Dunn, 1996). A meta-analysis of research on learning styles (Sullivan, 1993) reported that addressing a student's learning style through flexible teaching or counseling results in improved

achievement and attitude gains in students from a wide range of cultural groups.

Related to intelligence preference—or thinking styles—Sternberg (e.g., 1985, 1996) proposed that individuals have proclivities for one of three modes of thinking: analytical, practical, or creative. Research indicates that learners at primary, middle, and high school levels achieve better when instruction matches their preference (Sternberg, 1997; Sternberg, Torff, & Grigorenko, 1998). This body of research suggests that there are achievement benefits to addressing intelligence or thinking preference during the learning process, even if a final assessment is not in a learner's preferred mode (Grigorenko & Sternberg, 1997; Saxe, 1990; Sternberg et al., 1998).

Culture likely shapes both learning style and intelligence or thinking preferences (Anderson, 1988; Delpit, 1995; Heath, 1983; Lasley & Matczynski, 1997) in such areas as need for doing versus talking, how status is conferred and accepted, need for affiliation versus achievement, need for emotional closeness in learning environments, communication style, perceptions about time, task orientation, and so on. It is valuable for educators to realize that learning differences are influenced by the settings in which learners find themselves (contextual differences), as well as because of individual differences and differences stemming from a category or categories to which a person may belong. Understanding contextual impacts on learning gives educators an impetus to adjust the context appropriately, whereas individual and categorical differences may seem more immutable to teachers (Paine, 1990).

Studies of the impact of matching students' learning style and intelligence preference have found positive effects for many groups, including Native American, Hispanic, African American, Asian American, and Caucasian students (Dunn & Griggs, 1995; Garcia, 1995; Ladson-Billings, 1994; Sternberg & Grigorenko, 1997). Likewise, research suggests that gender shapes learning preferences (Baker Miller, 1986; Belenky, Clinchy, Goldberger, & Tarule, 1986; Gilligan, 1982; Lasley & Matczynski, 1997; Tannen, 1990), affecting preference for feeling versus thinking modes of learning, desire for collaboration versus competition, field dependence versus field independence, and so on. Despite numerous studies suggesting gender impacts on learning, there is not a substantial body of research examining achievement or attitude gains based on adjustment of learning conditions based on gender.

Experts in the field of learning-profile variance caution that no particular approach to learning is superior to another and that there

is great variance in learning preferences among every cultural and gender group (Delpit, 1995; Lasley & Matczynski, 1997). Further, any individual will represent several categories of gender, culture, intelligence preference, and learning style. In addition, some writers caution that the impact of race on learning for African American learners may be more potent than culture-shaped learning preferences (Hilliard, 2003).

The goal of effective instruction seems to be adequate flexibility in a teacher's mode of presentation and in a student's options for learning and expressing learning so that an individual can generally find a match for his or her learning-profile preferences. In addition, it appears important to learners, including those with learning problems, that they be taught strategies that help them become self-aware regarding their learning and that they take responsibility for and succeed in their own learning (King-Sears, 1998). In that way, a greater number of learners should be able to capitalize on their strengths and compensate for their weaknesses (Sternberg, 1985).

Hallmarks of Effective Differentiation

Based on theory and research, it appears important for teachers to consistently, defensibly, and vigorously adjust curriculum and instruction in response to student readiness, interest, and learning profile. Differentiation must be conceived and practiced as a reflection and extension of educational best practice, not a substitute for it. Unless the curriculum and instruction that are modified to be a good fit for academically diverse learners are sound, student outcomes are likely to be disappointing (Gamoran & Weinstein, 1995; Hootstein, 1998). Further, adaptations to curriculum and instruction would need to be distinct enough to address a wide range of readiness levels, interests, and learning modes. To that end, we propose that differentiation that effectively responds to learner readiness, interest, and learning profile should have the following characteristics.

1.   *Effective differentiation of curriculum and instruction is proactive, rather than reactive.*

A clear definition and model of the scope of effective differentiation is needed to counteract a tendency among teachers to believe they are addressing individual variance when they are, at best, making minor and occasional classroom modifications (Moon et al., 1995; Tomlinson, 1995). It seems unlikely that differentiation defined as tinkering with one-size-fits-all instruction can be robust enough to meet the learning needs of academically diverse popula-

tions. In fact, an impediment to more robust and effective differentiation may stem from a teacher-held perspective of differentiation as reactive—the teacher plans one lesson for everyone and tries to adjust on the spot when students signal the lesson isn't working for them—rather than proactive—the teacher plans a lesson that will, from the outset, address learner variance (Schumm & Vaughn, 1992; Tomlinson, 1995). Effective differentiation will likely arise from consistent, reflective, and coherent efforts to address the full range of learner readiness, interest, and learning profile in presentation of information, student practice or sense making, and student expression of learning.

   2.   *Effective differentiation employs flexible use of small teaching-learning groups in the classroom.*

   A meta-analysis of 165 effect sizes from studies of effects of within-class grouping on student achievement and other outcomes (Lou et al., 1996) found that students in small within-classroom learning groups (generally three to four in size) achieved significantly more than students not learning in small groups. In addition, students in grouped classes had more positive attitudes about learning and stronger self-concept measures than those in ungrouped classes. It appears that small-group settings give teachers the flexibility to address learner variance more appropriately than does sole reliance on whole-class instruction. The meta-analysis reports that low-ability students tended to learn better in heterogeneous groups, medium-ability students in homogeneous groups, and high-ability learners fared well equally in either setting. However, because of variance in student readiness across subjects, variability in student interest and mode of learning, and varying needs of categories of learners within a class, it appears important to group students in a variety of ways in the classroom.

   3.   *Effective differentiation varies the materials used by individuals and small groups of students in the classroom.*

   Student gains are greatest when instructional materials are varied for differing instructional groups, rather than using the same materials for all groups (Kulik & Kulik, 1991; Lou et al., 1996). Thus, in addition to flexible grouping of students, teachers in differentiated classrooms should match materials to the specific instructional needs of groups. This would seem particularly important when readiness differentiation is a focus of student groupings.

   4.   *Effective differentiation uses variable pacing as a means of addressing learner needs.*

   A number of studies have noted the ineffectiveness of classrooms in which teachers fail to adapt the pace of instruction in

response to learners' needs. Often the level of instruction is set to address mid- or high-achieving students, while the pace is set for low-achieving learners (Dahloff, 1971; Oakes, 1985), with the result that many students of varying readiness levels are frustrated (Ben Ari & Shafir, 1988). Classrooms in which time is used as a flexible resource would likely better serve the full range of learners.

   5.   *Effective differentiation is knowledge centered.*

   Teachers' sound knowledge of their discipline(s) provides a roadmap to the key concepts, organizing principles, and fundamental skills of those disciplines. In turn, teachers use materials and activities to ensure student understanding of essential ideas and ability to use important skills to solve meaningful problems (National Research Council, 1999). This sort of sound knowledge base and clarity of learning priorities is fundamental to effective differentiation, as it is to all good teaching.

   6.   *Effective differentiation is learner centered.*

   Learner-centered classrooms focus on the needs of students within the cognitive frameworks established by teachers (Schweinhart & Weikart, 1988). Among the traits of learner-centered classrooms are the building on the knowledge students bring to the task (Callison, 1998; Marlowe & Page, 1998; National Research Council, 1999; Vygotsky, 1986); ongoing assessment of learner understanding and skill to help the teacher teach and individual students learn more effectively (National Research Council; Palincsar, 1984); focusing on student sense making (Elmore, Peterson, & McCarthey, 1996; Schoenfeld, 1991); helping students see relevance and utility in what they are learning (Anderson, Reder, & Simon, 1996; Pintrich & Schunk, 1996; Vygotsky, 1986); student choice within teacher frameworks (Schweinhart & Weikart, 1988); shared management of learning; (Borko, Mayfield, Marion, Flexer, & Cumbo, 1997); and students playing an active role in learning (McLaughlin & Talbert, 1993; Queen, 1999; Vygotsky, 1986). In learner-centered classrooms, teachers use a wide variety of instructional strategies and approaches to scaffolding learning to ensure that each student links solidly with the important knowledge necessary to achieve understanding and power (Borko et al., 1997; Palincsar, 1984).

Aligning Academic Diversity and Classroom Practice

To "customize schooling for individual learners, rather than mass produce students who have essentially been taught the same thing

in the same way in the same amount of time . . . is not a superficial change; it is a deep cultural change" (Mehlinger, 1995, p. 154). We can dismiss neither the need to make classrooms a good fit for the full range of learners in them nor the immensity of the challenge in doing so.

It is likely that teachers are uncertain about how to make sense of the "otherness" of student experiences different from their own (Delpit, 1995; Paine, 1990); reflect only minimal amounts on students as individuals (Callahan et al., 2003); lack comfort in thinking about curricula in rich, conceptual ways (Callahan et al.; National Research Council, 1999); implement a narrow range of instructional approaches (Callahan et al.; Tomlinson, Callahan, Tomchin, et al., 1997); and are unsure of how to manage classroom routines in flexible, student-centered ways, rather than linear, teacher-centered ones (Callahan et al.; Tomlinson, 1995). Proficiency in each of these areas is required for effective differentiation for virtually any student or student population. Thus, educational leaders who commend to teachers more academically responsive teaching should understand that they are not asking for a minor modification in pedagogical practice. Such change is not even a matter of school reform; rather, it is a task of transforming teachers and schools (Lieberman, 1988).

It is likely necessary that educational specialists representing any particular population of learners would need to work for such transformation in general classrooms on two planes if academically responsive or differentiated teaching is to occur in any broad and effective way. First, it would be necessary to provide persistent support in changing the systemic factors that impede attention to learner variance (e.g., informed reflection on students as individuals, increasing competence in understanding the conceptual frameworks of the disciplines, growing proficiency with a wide range of instructional approaches, effective classroom management routines). In addition, it would be essential to share high-level knowledge about educational approaches that are effective with the particular population with which the educator has elected to specialize.

Leaders would need to acknowledge that teachers, like students, are nested in a culture and a context. Leaders would have to be fully committed to helping teachers reconstruct their sense of how students learn, how learning varies, what students should be taught, how they should be taught, and the role of the teacher in all of that—in addition to gaining increasing knowledge about particular needs of particular groups and individuals. The goal of staff development cannot be particular behaviors or skills for teachers; rather,

it is a rethinking practice (Richardson & Anders, 1994). Such a process is not simple, quick, or standardized (Stradling & Saunders, 1993). It does not lend itself well to advocacy for single populations without regard to need for systemic changes in the classrooms that increasingly serve academically diverse learners.

Instead, such teacher transformation calls for a common orientation among teachers, administrators, parents, students, and community to develop schools that understand, respect, and respond to individuals, eschewing a factory approach to students—and to teachers. It requires a permanent and sustained commitment from all stakeholders to achieving those goals. It necessitates ongoing cycles of personal and pedagogical reflection, conversation, and action to generate knowledge, understandings, and skills that largely do not exist in our schools. It requires personal and professional discomfort and struggle (Evans, 1996; Reynolds, 1999). There is no simple route to this complex destination. Leaders are ill-advised to believe otherwise.

Issues Requiring Further Study

Based on theory and research, it is possible to make a case for attending to the varying readiness levels, interests, and learning profiles of academically diverse students in contemporary classrooms. Nonetheless, research has suggested clearly that, while such an argument may be promising, there is considerable distance to span before the argument translates into pervasive practice. It is the case that, currently, few teachers make significant changes to teaching and learning routines in response to learner variance. Research and theory on change in schools indicates that such a scope of change is profoundly difficult, calling for persistent, sustained leadership and support for the change.

As movement in the direction of developing academically responsive classrooms is relatively new, so is the knowledge base that might ultimately support such classrooms. For example, we do not know the particular range of students for whom differentiated, heterogeneous classrooms might be effective. We do not know which of a variety of potential models of teaching and learning might best serve the learning needs of students who differ as learners. We do not know the relative impact of differentiating instruction based on learner readiness needs versus interests, versus learning profiles—nor whether it is important to address all of those elements simultaneously. Likewise, we need to investigate

the impact of such classroom elements as learning environment and affect on achievement of diverse populations. Certainly we do not fully understand teacher-development models that might enable teachers to enter the profession with attention to student variance and to grow systematically in responsive teaching throughout their careers. We have not determined the most fruitful roles for specialists in fields like gifted education, special education, second language learning, and so on to play in staff development. Neither do we know how to determine optimum amounts of time for students with special learning needs to spend in more heterogeneous versus more homogeneous settings. For researchers with an interest in this area of inquiry, the possibilities are virtually without limit. What we do know is that current classrooms are more academically diverse than ever and that most of those classrooms are ill-equipped to deal with the range of needs.

Nearly 4 decades ago, Jerome Bruner (1963) pointed out that our only course as educators—if we elect to honor the diversity of students we must educate—is to develop classrooms that challenge advanced learners without destroying the confidence and will to learn of those who are less advanced. To do this would require much from educators, but would recast our knowledge of teaching and learning, contribute to the professionalization of teachers, and make schools invitational places for all of our young citizens.

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