

*Phi Delta Kappan*

## PERSONALIZED INSTRUCTION

By James W. Keefe and John M. Jenkins

Kenneth Sirotnik and John Goodlad caution us to think in terms of school "renewal" rather than "reform." Sirotnik (1999) tells us that reform is usually preoccupied with accountability rather than evaluation. Much of high-stakes reform, for example, is aimed at rewarding or punishing schools and educators. Renewal, on the other hand, urges a new accountability more akin to "responsibility." Goodlad (1999, pp. 574, 575) points out that, "The language of reform carries with it the traditional connotations of things gone wrong that need to be corrected, as with delinquent boys or girls incarcerated in reform schools. This language is not uplifting. It says little or nothing about the nature of education, the self, or the human community .... School renewal is a much different game .... The language and the ethos of renewal have to do with the people in and around schools improving their practice and developing the collaborative mechanisms necessary to better their schools."

Renewal is concerned primarily with what Sarason (1989) calls "creating new settings" that reflect critical inquiry about educational practice. Renewal is all about learner growth in knowledge and self-awareness leading to wisdom, personal happiness, and collective responsibility. Only a minority of schools achieve these kinds of reflective and exploratory environments. Most schools are average and are satisfied with maintaining or perhaps fine-tuning traditional school organizational patterns and pedagogy.

### THE BASIC ELEMENTS OF PERSONALIZED INSTRUCTION

*Personalization of instruction and learning is the effort on the part of a school to take into account individual student characteristics and needs, and flexible instructional practices, in organizing the learning environment.* Teachers committed to personalizing instruction help their students develop personal learning plans, assist in diagnosing their cognitive strengths and weaknesses and other style characteristics, help adapt the learning environment and instruction to learner needs and interests, and mentor authentic and reflective learning experiences for their students.

In the past, antecedents of personalization have been known under different names: nongraded education, continuous progress education, individualized instruction, individually guided or prescribed education, and so forth. Each of these concepts is concerned with personalized education but in a limited way. Personalization is broader in scope, more systematic in organization, and more authentic in its goals and strategies.

Several current systematic approaches to instructional improvement, such as style-based instruction and differentiated instruction, do border on the truly personalized. The former typically draws on individualized instruction for its roots and the latter tends to restrict itself to the individual classroom, but both can be highly personalized when implemented in a comprehensive, organic and dynamic fashion.

What, then, are the basic elements of a personalized approach to instruction? If we consider the implications of historic efforts to renew schooling, and take into account the most flexible of recent efforts to individualize learning, a direction begins to emerge. Darling-Hammond (1997) argues that we must put students first, that all children have a right to learn. She cites four factors that are important for powerful teaching and learning:

- \* Structures for caring and structures for serious learning, structures that enable teachers to know students well and to work with them intensely.
- \* Shared exhibitions of student work that make it clear what the school values and how

students are doing.

\* Structures that support teacher collaboration focused on student learning, in particular, teacher teams.

\*Structures for shared decision making and dialogue about teaching and learning with other teachers, students and parents. (Darling-Hammond, 1996).

These structures are not a model to be imposed on schools but rather a broad blueprint for ongoing improvement in school organization and good practice. With this important caveat in mind, we propose *six basic elements of personalized instruction* (see Figure 1) that should be present if a school wishes to develop powerful teaching and learning for student success. These elements or structures produce a challenging, integrative, but child-centered learning environment, one that is interactive and meaningful, but with reasonably structured learning activities, flexible use of time and space, and authentic, performance-based assessment of student progress.

We think of these six basic elements as constituting the culture and context of personalized instruction. The cultural components--teacher role, student learning characteristics, and collegial relationships--establish the foundation of personalization and ensure that the school prizes a caring and collaborative environment, student diversity, and individual development. The contextual factors--interactivity, flexible scheduling, and authentic assessment--promote and support student engagement, thoughtful growth, and proficient performance.

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#### **FIGURE 1. BASIC ELEMENTS OF PERSONALIZED INSTRUCTION**

1. A dual teacher role of coach and adviser.
2. The diagnosis of relevant student learning characteristics, including:
  - . Developmental level;
  - . Cognitive /learning style;
  - . Prior knowledge/ skills.
3. A culture of collegiality in the school, characterized by:
  - . A constructivist environment;
  - . Collaborative learning arrangements.
4. An interactive learning environment characterized by:
  - . Small school or small group (class) size;
  - . Thoughtful conversation;
  - . Active learning activities;
  - . Authentic student achievement.
5. Flexible scheduling and pacing, but with adequate structure.
6. Authentic assessment.

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## 1. DUAL TEACHER ROLE

The indispensable catalyst in the personalized instructional environment is the teacher, the instructional specialist who is closest to the learning situation and best understands the needs and interests of students as well as the policies of the school and the district. Personalized instruction demands that the teacher assume the dual roles of subject-matter coach, consultant and facilitator, and teacher-adviser to a select group of students. As learning coach, the teacher collaborates with other teachers, student peer tutors, and community resource persons to guide student learning. As teacher-adviser, the teacher provides advice, counsel, and guidance to 15 to 20 students on academic and school-adjustment issues.

### TEACHER-COACH

Teacher-coaches offer the same kind of instruction, demonstration, practice, and feedback to their students that athletic coaches and student activity advisers have modeled in the most successful of their programs. The needs of today's students are quite different from those of their counterparts two or three generations ago. The world has experienced several social revolutions and a knowledge explosion that makes it almost impossible to "cover" more than a small part of what students need to know for a reasonably successful life. Cognitive and problem solving skills, what some call metacognitive skills, are more important today than any particular piece of knowledge. The teacher-coach in the school environment must be a facilitator of learning, a learning guide who helps students find appropriate resources and engage in suitable learning activities.

Members of the Learning Environments Consortium International (Georgiades, Keefe, Lowery et al., 1979) describe such a teacher as "not so much educational broadcaster as academic troubleshooter. He devotes fewer hours to lecturing in front of a class and more to working with students individually and in small groups."

### TEACHER-ADVISER

Teacher-advisers are the first-line of offense and defense in a school guidance program geared to student success. Advisement is the other facet of the new teacher job description--a helping role. Teachers and other qualified adults join professional counselors in helping students plan and achieve appropriate career and personal-social goals. In advisement, teachers, counselors, and other adults work as a team to promote student adjustment and success in school. Professional counselors serve as advisers to a group of teacher-advisers and help them to learn their role and its functions.

Over the years, advisement programs have been called expanded homeroom, advisory period, home base, advisory base, student assistance, teacher adviser, adviser-advisee, and personal adult advocate. The programs have varied from place to place, but generally call for a teacher to assume school guidance functions that are narrowly limited to academic program planning, career/college information, school adjustment issues and personal-social guidance.

In middle schools, many adviser programs take on the character of group guidance, but these applications are usually limited in scope and often in success. The most successful advisement programs emphasize personal contact between students and advisers and continuing support of the student in his or her academic program and personal adjustment to school. The 1996 NASSP Breaking Ranks report specifically mentions the role of the Personal Adult Advocate in helping the student personalize the education experience.

## 2. DIAGNOSIS OF STUDENT LEARNING CHARACTERISTICS

If the goal is to build a learning environment suited to the aptitudes, needs, and interests of each student, personalized instruction must begin with knowledge of the learner. The foundation of any personalized instruction approach is some form of diagnosis--determining what are the learning related characteristics of individual learners. Direct teacher observation and various types of diagnostic assessment are among the principal tools of instruction viewed as coaching, mentoring, facilitating, and advising. Diagnosis is concerned with discovering such student learning traits as developmental level, learning style, and learning history.

## **DEVELOPMENTAL CHARACTERISTICS**

Developmental characteristics are those specific stages in individual maturation when certain capacities for learned behavior appear (e.g., visual perception, language pronunciation, and cognitive thinking skills). Examining these characteristics of students can tell us when they are developmentally ready to learn something. They describe individual readiness for learning. Certain capabilities appear only after the appropriate stage in individual development occurs. If not exercised then, the capacities are not likely to develop later (e.g., skills in athletics, peer relations, language learning, etc.). If teachers are to personalize student instruction, they must have a good understanding of learner developmental traits.

Darling-Hammond (1997) calls for "developmentally attentive schools," starting with the presumption that schools should be user-friendly. School organization and student work must build on student developmental considerations. Learning activities should be based on student needs and legitimate interests rather than, arbitrarily, on generic curriculum guides or the contents of approved textbooks. Particularly in the lower grades, students need hands-on learning with active and concrete learning activities. Nor should developmental attentiveness end with primary schooling. Braddock and McPartland (1993) argue that many problems that teenagers have in school are a result of the notable mismatch between their developmental needs and the learning environments of most junior and senior high schools. When teenagers need close relationships, they get large, impersonal schools. When they need to experience autonomy, they get rigid rules, curricular tracking, and large doses of memorization.

## **STUDENT LEARNING STYLE**

Student learning style is the second broad diagnostic element. Learning style encompasses information-processing habits, attitudinal tendencies and biologically based responses that are typical of the ways a given student learns and prefers to learn. There are three broad categories of learning style characteristics:

- \* Cognitive styles are preferred ways of perception, organization and retention. For example, perceptual modality preferences--whether a student prefers visual, auditory, or psychomotor learning--are basic to cognitive style diagnosis.
- \* Affective styles include those dimensions of the learning personality having to do with attention, emotion, and valuing. Each learner has a personal motivational approach.
- \* Physiological styles are individual traits deriving from a person's gender, health and nutrition, and reaction to the physical surroundings, such as preferences for levels of light, sound, and temperature in the learning environment.

Learning style is a gestalt that tells us how a student learns and prefers to learn. The Learning Style Profile, for example, assesses independent scales representing four factors: perceptual responses, cognitive styles, study preferences, and instructional preferences. Seven cognitive skills are profiled including sequential and simultaneous processing skills. The Learning Style Profile and other comprehensive style instruments help teachers identify student style strengths and weaknesses and

organize instruction more efficiently and effectively.. Learning style diagnosis is a key element in any attempt to make instruction more personalized.

### **STUDENT LEARNING HISTORY**

"Student learning history" is a term coined by Benjamin Bloom and his colleagues in mastery learning research to describe the aggregate of personal learning that each student brings to a particular course, class, or school program. A learner's "history" characterizes his or her instructional readiness or "entering behavior." Learning history is the third broad area of diagnosis. In fact, existing student knowledge, skills and attitudes define the fertile ground for student success in subsequent learning.

Learning history tells us *what* a student knows and can do at a given point in his or her learning career--the knowledge, skills and attitudes that the student possesses before beginning a new learning experience. Diagnosis of learning history involves the determination of what has occurred as a basis for what should occur. Observation, surveys, inventories, and curriculum-referenced tests (rather than the traditional standardized tests) best assess these knowledge or skill levels. Information about student learning history is also available to teachers in cumulative record folders, in teacher and counselor reports, and from student questionnaires, inventories, and various diagnostic tests.

### **3. CULTURE OF COLLEGIALITY**

Another essential ingredient of personalized instruction is a school culture of collaboration where teachers and students work together in a cooperative social environment to develop meaningful learning activities for all students. Choice theory (Glasser, 1986) proposes that all behavior is an attempt to satisfy basic needs hardwired into our genetic structure. We always choose to do what is most satisfying to us at the time. Glasser tells us that "if what is being taught does not satisfy the needs about which a student is currently most concerned, it will make little difference how brilliantly the teacher teaches--the student will not work to learn .... Teachers are well aware that hungry students think of food, lonely students look for friends and powerless students seek attention far more that they look for knowledge." A constructivist environment and collaborative learning arrangements characterize a collegial culture.

### **CONSTRUCTIVIST ENVIRONMENT**

Many educators today have adopted a constructivist view of schooling. Constructivism holds that individual learners construct knowledge by giving meaning to their current experiences in the light of their prior knowledge. Time and opportunity for reflective dialogue are critical elements of such a learning environment. Constructivist teachers build instruction on student learning styles and skills, and encourage students to seek out personal knowledge of a topic. Students work with their teacher-coaches to improve their cognitive skills and to expand their current experience through reflection, seminars, and long-term projects. Constructivist teachers look for opportunities to encourage student reflection, problem solving and initiative.

### **COLLABORATIVE LEARNING ARRANGEMENTS**

The task of personalized instruction is to create learning communities in which students can confront important ideas and apply these ideas to real-world experiences that they can understand and use. Collaborative learning arrangements provide an opportunity for students and teachers to work together to verbalize their ideas, to sharpen their thinking, to capitalize on differences. Considerable evidence exists, for example, that students learn better in cooperative groups than when alone (Slavin, 1991, 1995). Cooperative small groups encourage collaboration that is more useful and better socialization than traditional classrooms, yet produce solid achievement gains.

Glasser (1986) believes that small learning teams offer a good chance of motivating almost all students,

for several reasons. Students gain a sense of belonging by working in teams of two to five and a sense of belonging provides the initial motivator for students to do the work. As they achieve some success, they will want to work even harder. Stronger students, Glasser argues, find it need-fulfilling to help weaker students, and weaker students find it need-fulfilling to contribute to the team effort. Students learn to depend not only on the teacher but on the teammates and their own creativity. Collaborative learning arrangements are necessary for a personalized learning environment because they promote interaction, dialogue, and thoughtful reflection.

#### **4. INTERACTIVE LEARNING ENVIRONMENTS**

Interactive learning environments are designed to foster collaborative learning and reflective conversation.. Recent studies have found that high schools restructured to provide interactive learning arrangements produce higher student achievement gains that are also more equitably distributed among socioeconomic subgroups (Lee & Smith, 1995). These studies found that collective responsibility for student learning, an academic emphasis, and high morale are important features of a successful school learning community. Successful practices included school-within-school units, interdisciplinary teaching teams and common teacher planning time. Interactive learning environments are characterized by small school or group size, thoughtful classrooms, active learning experiences, and authentic student achievement. Let us explore these characteristics.

##### **SCHOOL OR GROUP SIZE**

Darling-Hammond (1997) reports that more than 30 years of studies on school organization "have consistently found that small schools (with enrollments of roughly 300 to 600) promote higher student achievement, higher attendance, lower dropout rates, greater participation in school activities, more positive feelings toward self and school, more positive behavior, less violence and vandalism and greater postschool success. These outcomes are also found in settings where students have close sustained relationships with a smaller than average number of teachers throughout their school careers." The 1996 NASSP Breaking Ranks report also recommended that high schools not exceed 600 students.

Unfortunately, earlier studies on class size are inconclusive or at least debatable. Smaller class size is invariably the better choice when the group is 20 or less, but in the range from 20 to 40 students, class size makes little or no difference (ERS, 1978; Glass & Smith, 1978). Class size studies are difficult to conduct because so many other socioeconomic, organizational, and instructional variables can intervene. The issue becomes moot, however, when one approaches the issue of class or group size from the learner's point of view. The issue, then, is how can the client best be served? What kind of grouping (large, medium, small) best serves the target content or the activity? A choir or a band usually benefits from a larger size. Skill learning, discussion, and reflective conversation demand small groups. Research and reading are often best done alone. The size of the group should be a function of its purpose. Having said this, however, we should reiterate that most school-based learning benefits from smaller-sized groups because they encourage collaboration, interaction, and shared satisfaction.

##### **THOUGHTFUL ENVIRONMENTS**

Smaller schools and small group size can better support thoughtful conversation, learning by doing, apprenticeship experiences, and authentic student achievement. Schrag (1992) argues for more "thoughtfulness" in classrooms. Researchers at the University of Wisconsin National Center on Effective Secondary Schools developed a set of rating scales for "thoughtful lessons" in social studies based on Schrag's conception of good thinking. The University of Wisconsin research found that social studies classes in 16 schools evidenced more thoughtfulness when school principals and department chairs promoted thinking as a central goal.

Instruction is thoughtful when it focuses on a few important topics with coherence and continuity, provides

plenty of time for investigation and interactive dialogue, raises challenging issues that require students to produce new knowledge, and stresses the quality of supporting explanations and reasons over the need for "right" answers. Barry Beyer (1992, pp. 94-95) argues that at least four elements must be present for a thoughtful learning environment:

1. Classroom layout that invites thinking--not in traditional rows, but students facing each other in groups, working in learning centers or in meaningful clusters.
2. Classroom interactions that involve information processing, rather than information receiving or repeating--posing and solving problems, seeking out evidence, and judging the quality of supporting reasons.
3. The use of precise, thoughtful language rather than vague terminology or generalizations--hypothesizing, sifting evidence, questioning inferences and assumptions, making predictions, drawing conclusions.
4. The organization of classroom study and courses around thoughtful questions--inquiry built on questions of real interest to students themselves.

### **ACTIVE LEARNING EXPERIENCES**

Susan Kovalik and Karen Olsen (1998) contend that prior learning experiences are critical to the success of active forms of learning. The human brain continuously searches for patterns in incoming information as it attempts to find meaning in the data. The more active the learning experience, the more likely that the input will be rich in meaning. Kovalik and Olsen (1998) suggest two rules of thumb for enhancing learning:

- \* Provide real-life richness and context in all learning situations. The less the input, the harder the learner will struggle to find meaning.
- \* Curriculum and instruction must try to utilize all of a learner's prior experience and to maximize the amount of sensory input during learning. Human learning is rarely linear or neat or orderly or typically logical, but rather multilinear, multisensory, and seemingly illogical until the learner perceives clear patterns in the information that are personally meaningful.

At Central Park East Secondary School in New York City, all of the classes are organized in seminar style. The objective is to encourage an interactive and more active learning environment. Central Park East students spend their classroom time "building replicas, writing books, transcribing interviews, constructing mathematical models, creating dramas, developing photos, writing lab reports or debating a class decision." In the field, they spend their time "collecting samples, interviewing contacts, sketching and drawing, looking for tracks, measuring, recording, searching, or just asking why. The point is that they are "learning through doing, through genuine experience" (Wood, 1992). Teachers who are concerned about personalizing the learning process believe in teaching through genuine experiences and thoughtful reflection.

### **AUTHENTIC STUDENT ACHIEVEMENT**

Instruction is authentic when it focuses on the kind of mastery found in successful adults and personalized instruction must be authentic. Authentic human achievement is concerned with what is significant, worthwhile and meaningful in the lives of successful adults from all walks of life--from artists and electricians to laborers and scientists. Authentic academic achievement, then, must be concerned with accomplishments that are significant, worthwhile, and meaningful for learners preparing for adulthood (Keefe & Jenkins, 1997).

The Center on Organization and Restructuring of Schools (CORS) at the University of Wisconsin-Madison devoted five years of research to the formulation and study of criteria and standards for

authentic academic achievement, authentic instruction, authentic assessment tasks, and authentic performance (Newmann, Secada, & Wehlage, 1995). The center characterized authentic academic achievement in terms of three criteria:

1. Construction (not reproduction) of knowledge,
2. Disciplined inquiry (mastery of a field), and
3. Value beyond school.

Human cognition is complex, but the need for "authenticity" in learning is straightforward. All learners need to feel competent and capable to understand and accomplish real-world tasks. Newmann, Secada, and Wehlage (1995) argue that "the kind of mastery required for students to earn school credits, grades, and high scores on tests is often considered trivial, contrived, and meaningless--by both students and adults. This absence of meaning breeds low engagement in schoolwork and inhibits transfer of school learning to issues and problems faced outside the school." Engagement here is the key word. Without engagement, much of schooling is meaningless and unproductive. It is difficult to envision a personalized instructional environment without the element of authenticity.

## 5. FLEXIBLE SCHEDULING AND PACING

The schedule of a school makes the educational philosophy of the school evident and visible. If the philosophy is traditional, the schedule will likely be very structured, even rigid. If the philosophy is constructivist or learner-centered, the schedule will almost necessarily be personalized or at least very flexible.

Two ingredients seem necessary to the development of a more personalized school schedule for students. First, both students and teachers need input into the use of time. Teachers can accomplish this by making requests through team leaders or department chairs or other representatives. This information can be communicated to teacher-advisers who meet with individual students to guide their scheduling decisions and monitor student progress. (Obviously, state and local mandates must be acknowledged, such as graduation requirements.) Waiver processes are now in effect in most states that permit some latitude in redefining credits and time. Second, achievement should be judged on a performance basis. Placing the emphasis on performance rather than time increases the opportunities for student choices in curriculum and instruction. (See the discussion of authentic assessment below for more on performance-based assessment.)

In his book, Horace's School: Redesigning the American High School, Theodore Sizer (1992) proposes a sample high school schedule designed to tailor school practices to the needs of every group of adolescents (Figure 2). Periods 1, 2, and 6 are 105 minutes each. Periods 3, 4, and 5 share 2 hours for lunch, advisory, and tutorials by the teaching team. Team members decide on group and individual activities. Advisers schedule tutorials for individual students. Period 1 has a 10-minute passing period; all others have 5 minutes. Subjects are scheduled on a four-day rotation to provide opportunities for teachers and students to meet at different times of the day.

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**FIGURE 2. SAMPLE SCHEDULE FROM THE COALITION OF ESSENTIAL SCHOOLS**  
 (REPRODUCED FROM SIZER, 1992, P. 226)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
7:00-8:00	Activities (band, chorus, etc.)				
8:00-9:45	Period I				



9:55-11:45 Period 2

11:45-1:45 Periods 3, 4 and 5: Lunch, Advisory, Tutorials

1:45-3:30 Period 6

3:30-4:00 Team Meetings for the Staff

4:00 Activities (band, chorus, etc.)

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The longer time periods in this kind of block schedule permit students to take part in community service and other extended experiences. Teachers have time to plan with colleagues, to serve as advisers to a prescribed number of students, to work on curriculum, instruction, and assessment, and to contact parents. These priorities show the relationship of scheduling to the purposes of the school.

## 6. AUTHENTIC ASSESSMENT

Authentic assessment is the sixth defining element of personalized instruction. Assessment is the process of gathering information about students. The improvement of student learning, not sorting or grading, is the primary purpose of assessment. Assessment is authentic when it focuses on real performance and mastery of a field of knowledge. Assessment and testing are often used interchangeably. Tests, however, are only one form of assessment. Assessment goes beyond testing and includes such activities as demonstrations, oral and written presentations, performances, contests, projects, and problem solving activities. Athletic competitions are assessments of how well a team or an individual has prepared for a contest. Similarly, a dramatic performance is an assessment of the cast's talents and readiness. (The audience response is one measure of the quality of the performance.)

In all cases, the method of assessment should fit the purpose of instruction. If students are expected to learn to write well, the competency can hardly be measured by multiple-choice questions about grammar. Having the students actually write or develop responses to open-ended questions seems a more suitable device. Even better is to give them time to write and then revise their writing. The various types of authentic assessment can be grouped under naturalistic assessment, performance assessment, and portfolio assessment (Case, 1992).

*Naturalistic assessment* is the kind of appraisal that takes place during normal learning activities. Naturalistic assessment involves the teacher as a "participant-observer," a technique long used in anthropology. The teacher systematically collects information about students and records it for later analysis and summation.

*Performance assessment* is an omnibus term that "refers to evaluating what students can do by examining them in the process of demonstrating some skill, by performing a specified task, or a product that students construct and develop in response to a set of directions" (Ryan & Miyasaka, 1995). The object of this kind of assessment is a student performance or student-developed product. Performance assessment can be directed to such diverse activities as conducting a science experiment; using or programming a computer; debating; manufacturing or repairing an object; playing a musical instrument; speaking a foreign language; and writing a script or story. The merit badge system used in scouting is a form of performance assessment. Some educators call the more formal versions of these performance assessments, "exhibitions," which are comprehensive demonstrations that enable students to present their academic efforts for review and discussion, and to certify their competencies.

*Portfolio assessment* involves both students as compilers and teachers as supervisors. Students collect and select pieces of their own work over a period of time as evidence of completing their learning

objectives or targets. Usually, students also write a rationale to explain why they think the selected pieces are their best work. Portfolio assessment has its origins in the practices of artists, architects, and designers who assemble key examples of their work for employment interviews or to affirm their levels of competence. (Case, 1992; Ryan & Miyasaka, 1995).

## THE BIG PICTURE

George Wood (1992, pp. 27-29) characterizes the quintessential personalized instructional environment in his description of the learning community at Hubbard Woods Elementary School in Winnetka, Illinois. Wood writes:

"A community of learners." This is the watchword of the Winnetka school district. It graces the cover of the most recent district curriculum report, appears frequently in newsletters home, and is often referred to by the staff as a guiding principle. It is not mere rhetoric. The notion of the school as a learning community directs virtually all aspects of the school--from the length of the school day, to teaching, to staff relations, to the very layout of the buildings ....

Most tasks are taken on collaboratively, with students working in teams to solve problems, create large-scale displays, or write plays, for example. Much of this is possible because the curriculum is geared to the developmental needs of children.

Rather than workbooks and worksheets which require only the ability to manipulate a pencil and to copy, most classroom tasks involve a hands-on experience. Math games, tools for measuring or counting, costumes for plays, plants and animals all fill the rooms so that students can touch, feel and experiment as they learn. Such learning does not require that students memorize "correct" answers, compiling enough of them to earn a grade; in fact, letter grades are not given. Rather, students learn through collaboration how to help one another find out, how to ask good questions, in short, how to learn. The notion of competitiveness on abstract tasks only hinders learning, and so these teachers break away from that orientation.

In the final analysis, personalized instruction reflects deep concern for learners and the willingness to search for ways to adjust the teaching/learning environment to meet the learning needs of individual students.

## REFERENCES

- Beyer, B. K. (1992). *Teaching thinking: An integrated approach*. In J. W. Keefe & H. J. Walberg (Eds.), *Teaching for thinking*. Reston, VA: The National Association of Secondary School Principals.
- Braddock, J. H., & McPartland, J. M. (1993). *The education of early adolescents*. In L. Darling-Hammond (Ed.), *Review of research in education* (Vol. 19, pp. 135-170). Washington, DC: American Educational Research Association.
- Case, R. (1992). *On the need to assess authentically*. *Holistic Education Review*, 5 (4), 14-23.
- Darling-Hammond, L. (1996). *The right to learn and the advancement of teaching: Research, policy and practice for democratic education*. *Educational Researcher*, 25 (6), 5-17.
- Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work*. San Francisco: Jossey-Bass Publishers.
- Deming, W. E. (1993). *The new economics for industry, government, education*. Cambridge, MA:

Massachusetts Institute of Technology.

Georgiades, W. D., Keefe, J. W., Lowery, R. E., et al. (1979). *Take five: A methodology for the humane school*. Los Angeles: Parker and Son.

Glass, G. V., & Smith, M. L. (1978). *Meta-analysis of research on the relationship of class size and achievement*. *Educational Evaluation and Policy Analysis*, 1, 2-16.

Glasser, W. (1986). *Choice theory in the classroom*. New York: Harper Perennial.

Goodlad, J. I. (1999). *Flow, eros, and ethos in educational renewal*. *Phi Delta Kappan*, 80 (8), 571-578.

Keefe, J. W., & Howard, E. R. (1997). *Redesigning schools for the new century: A systems approach*. Reston, VA: National Association of Secondary Principals.

Keefe, J. W., & Jenkins, J. M. (1997). *Instruction and the learning environment*. Larchmont, NY: Eye on Education.

Kovalik, S., & Olsen, K. D. (1998, March/April). *The physiology of learning--Just what does go on in there?* *Schools in the Middle*, 32-37.

Lee, V E., & Smith, J. B. (1995). *Effects of high school restructuring and size on gains in achievement and engagement for early secondary students*. Madison, WI: Wisconsin Center for Educational Research, University of Wisconsin.

Newmann, F. M., Secada, W. G., & Wehlage, G. G. (1995). *A guide to authentic instruction and assessment: Vision, standards and scoring*. Madison, WI: Wisconsin Center for Educational Research, University of Wisconsin.

Peel, J., & McCary, C. E., III. (1997, May). *Visioning the "little red schoolhouse" for the 21st century*. *Phi Delta Kappan*, 698-705.

Ryan, J. M., & Miyasaka, J. R. (1995). *Current practice in testing and assessment: What is driving the changes?* *NASSP Bulletin*, 79 (573), 1-10.

Sarason, S. B. (1989). *The creation of settings and the future societies*. San Francisco: Jossey-Bass.

Schrag, F. (1992). *Nurturing thoughtfulness*. In J. W. Keefe and H. J. Walberg (Eds.), *Teaching for thinking*. Reston, VA: The National Association of Secondary School Principals

Sirotnik, K. A. (1999). *Making sense of educational renewal*. *Phi Delta Kappan*, 80 (8), 606-610.

Sizer, T. R. (1992). *Horace's school: Redesigning the American high school*. Boston: Houghton Mifflin.

Slavin, R. E. (1991). *Synthesis of research of cooperative learning*. *Educational Leadership*, 48 (5), 71-82.

Slavin, R. E. (1995). *Cooperative learning: Theory, research and practice (2nd ed.)*. Needham Heights, MA: Allyn and Bacon.

Wardman, K. T. (1994). *From mechanistic to social systems thinking (a digest of a talk by Russell L. Ackoff)*. *The Systems Thinker*, 5 (1), 1-4.

Wood, G. H. (1992). *Schools that work*. New York: Plume.

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