

Strategies for Personalizing Instruction: A Typology for Improving Teaching and Learning

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It is often difficult to classify instructional approaches. To best serve the diverse needs of today's students, a personalized instruction approach is suggested. Nine representative strategies for personalizing instruction are discussed in relation to their interaction level and thoughtfulness level.

Some educators believe that there is only one way to personalize instruction. For many, it means getting to know students personally, being friends with them, and knowing their names. For others, it means establishing an instructional procedure in which a student progresses at his or her own rate through a predetermined curriculum. In actuality, personalized instruction embraces all of those elements and a good deal more.

Interestingly, when one searches the Internet for references to personalized instruction, most sites describe programs for at-risk students. For personalized instruction, the student–teacher ratio is usually maintained at a figure well below what is found in regular classes. The assumption is that small classes enable teachers to offer more personalized instruction to students who have not been successful with traditional schooling. Smaller classes do not necessarily ensure that personalized instruction will follow. Personalized instruction seems more a matter of the quality of interaction and thoughtfulness among the student and the teacher and other instructional resources. It is also contingent on the teacher's understanding of the principles of contemporary cognitive science.

Instruction is personalized when it focuses specifically on the needs, talents, learning style, interests, and academic background of each learner, and when it challenges each learner to grow and advance. In our view, personalized instruction encompasses six basic elements:

- A dual teacher role of coach and adviser
- The diagnosis of relevant student learning characteristics

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- A school culture of collegiality
- An interactive learning environment
- Flexible scheduling and pacing
- Authentic assessment.

Types of Learning

The types of personalized instruction included in this article are by no means exhaustive. They represent a sampling of what seem to be the best current attempts at making instruction more interactive and more thoughtful. They also reflect optimism that strategies can be devised to enable more students to succeed with challenging schoolwork. The ideal of personalized instruction suggests that, to the degree that schools can accommodate individual differences effectively, students can be successful in school. The more intense the interaction between the sources of instruction and the student, the more likely the student will learn. Students engage thoughtful material at their level of development and can then advance to more challenging levels. Eventually the students come to a point where they can solve problems previously not encountered and generate new knowledge in a particular domain or discipline.

We rate personalized instruction approaches on two continua: (a) the responsiveness of the instruction (teacher, mentor, materials, and other aspects of the learning environment) to differential learner characteristics, and (b) how effectively learners thoughtfully apply knowledge and skills in a variety of circumstances. We selected four levels for each broad characteristic ranging from 1 (*lowest*) to 4 (*highest*). Figure 1 illustrates the levels for interaction and figure 2 illustrates the levels for thoughtfulness. Figure 3 combines these continua into a two-dimensional matrix and locates each of 20 selected strategies in a cell showing our best estimate of where it falls along the combined continuum.

The 20 strategies displayed in figure 3 were selected because they contain one or more of the elements of personalized instruction. Care was also taken to select only those strategies that could be supported by a reasonable body of research. Nine representative strategies are included in this article along with their interaction level (I) and their thoughtfulness level (T). A complete description of all 20 strategies can be found in *Personalizing Instruction: Changing Classroom Practice* (Keefe and Jenkins 2000).

Individualized Instruction (I-1, T-1)

This strategy was initially associated with Skinnerian programmed instruction. Students worked through programmed materials at their own rate of speed. Skinnerian forms of programming always follow the same format:

Figure 1. Levels of Interaction

1	2	3	4
Adjustments to differences in learner characteristics are limited.		Adjustments to differences in learner characteristics are frequent and comprehensive.	

- A question or problem of some sort is displayed
- The student is required to respond actively by constructing an answer
- Feedback, either reinforcement or correction of an error, is immediate
- Errors are minimized through the following procedures: (a) material is presented in small steps that capitalizes on what the student already knows; and (b) techniques of prompting, fading, shaping, and chaining are used
- Students work at their own pace.

Individualized instruction has been modernized using various self-instructional materials and techniques, including computer-assisted software programs, especially for students with weak basic skills.

Adaptive instruction and individually guided instruction (IGE) are two contemporary applications of individualized instruction. The former was created for students with special needs and resulted in the development of the individualized education program (IEP). IGE was developed by the Institute for Development of Educational Activities, a division of the Kettering Foundation. Student assessments are conducted in the subject areas to determine achievement levels. The students are then assigned to instructional groupings or offered individual work based on the results of the assessment. Adaptive instruction and IGE emphasize success for students by adjusting instruction to their academic level of functioning. Both approaches allow for individual progress through predetermined content and permit students to progress at their own rate.

Accelerated Learning (I-1, T-2)

Henry Levin of Stanford University formulated a plan for improving the learning of at-risk and low-achieving elementary school students. The plan operates on the principle that those students should have enriched and accelerated instruction rather than the traditional remediation. Accelerated learning schools are designed to bring all students into the educational mainstream by building on their natural strengths, acknowledging the different experiences that they bring to the school setting and by consistently stressing higher expectations. One of the project's main features is the use

Figure 2. Levels of Thoughtfulness

1	2	3	4
Learners acquire basic knowledge and skills to enhance their ability to learn on their own.		Learners apply knowledge and skills to solve real problems and create new knowledge.	

of learning strategies and tactics usually found in programs for gifted and talented students. The goal is to speed up the learning of at-risk students so that they will be able to perform at grade level by the end of elementary or middle level school.

The approach is labeled “powerful learning” and includes active learning experiences through independent projects, problem solving, and work with manipulatives (Levin and Hopfenberg 1991). Members of the school community work together to transform classrooms into powerful learning environments where students are encouraged to think creatively, explore their interests, and achieve at high levels. Because the instructional program is not prescribed, schools determine their own levels of interaction among students and teachers. The instructional approach operates on the assumption that at-risk students share strengths that schools often overlook. According to Levin and Hopfenberg (1991), at-risk students typically bring curiosity in oral and artistic expression, the ability to learn through manipulation of appropriate learning materials, and the capacity to delve eagerly into intellectually interesting tasks.

Style-Based Instruction (I-2, T-2)

Style-based instruction adjusts the learning environment to differences within and among students. Usually a formal assessment is conducted with a generic learning style instrument. Depending on the nature of the instrument, profiles are derived that give information about perceptual modalities, cognitive skills, and instructional and study preferences. Teachers confirm results by observing students at work, conducting personal interviews, or administering more intensive diagnostic instruments. The results are used to plan and implement alternative teaching activities.

Differences in perceptual strengths and preferences are usually accommodated by introducing new or difficult information with the individual student’s strongest perceptual mode and reinforcing it with secondary and tertiary strengths.

Style-based approaches use contract activity packages (CAPs) and other types of individualized learning packets to offer students choices in how they meet common objectives. Those materials replace whole-class

Figure 3. Personalized Instruction

		THOUGHTFULNESS LEVEL			
		1	2	3	4
INTERACTION LEVEL	1	Individualized instruction	Accelerated learning; mastery learning; direct instruction	Independent study/quest; Montessori approach	
	2	Experiential learning	Style-based instruction	Technology-assisted learning	
	3		Cognitive skill development; inquiry approaches	Contract learning; peer tutoring	Authentic pedagogy
	4			Dewey's Project Learning; reciprocal teaching	Guided practice; cooperative learning; cognitive apprenticeship; topic study

instruction. CAPs, for example, are subject-matter outlines for students who respond favorably to a structured learning environment or thrive with choices. CAPs contain a variety of resources: auditory (audiotapes), visual (books, transparencies, and videotapes), and kinesthetic (simulations, interactive CD-ROMs, and games). Those resources provide the information that students need to meet the CAP objectives (Dunn and Dunn 1992).

Comprehensive style-based instructional models also attempt to accommodate cognitive style differences by offering students skill augmentation or enhancement and by providing supportive learning environments while students work to improve their cognitive skills. Usually, style-conscious teachers work with class groups, varying instruction within the total group to accommodate individual differences. What makes a style-based program personalized is the instructor's attempt to diagnose and accommodate differences and use them to enhance varying skills among students.

Technology-Assisted Learning (I-2, T-3)

The skillful use of technology expands learning opportunities for more students. Learners can work individually at computer stations and proceed

through a curriculum at their own rate. For example, business education programs at many high schools simulate an actual office facility. A careful selection of courseware enables business teachers to expand offerings while providing a flexible schedule to meet students' needs. On arrival, students check in with a receptionist and proceed to workstations where they log on to one of many different programs. Students can start and stop a course at any time without disrupting teachers or other students. Teachers monitor student progress, observe students, and work and intervene when appropriate.

Integrated Learning Systems (ILS) use computers for instruction and as a management information system. ILS courseware provides a sequence of lessons that generally span several traditional grade levels in mathematics, reading, and language skills. The courseware can be networked on multiple computers and includes a management information system that monitors student performance and provides diagnostic and prescriptive information based on student progress (Newman 1992).

Strategic use of CD-ROMs and the Internet enables students to research topics of special interest or specific content in the curriculum. Working alone, in pairs, or in learning teams, students can more readily engage each step of the research process: questioning, planning, gathering information, sorting and sifting, synthesizing, evaluating, and reporting results to real or simulated decisionmakers. E-mail allows student researchers to interact with experts in a field, other researchers, or university professors. Students can also collaborate with other students or mentors in different parts of the country or the world.

At Virtual High School, a private school in Vancouver, British Columbia, Canada, students use computers and online communication to establish their own learning agendas. All students have a laptop computer and do much of their work at home, plugging into the school's computer network. Students create their own curriculum, working with mentors (a title that has replaced that of "teacher" at the school). A few students work with commercial customers designing customized software (O'Neill 1996).

Contract Learning (I-3, T-3)

Contract learning is an approach to instruction in which a teacher and a student design a learning activity with its own objectives, activities, timeframe, and assessment. Then, with teacher supervision, the student implements the contract on his or her own. The contract does not replace other methods of instruction, but it offers an alternative for students who wish to accelerate, study a subject more in depth, or pursue a special interest.

Teachers monitor students' progress on contracts, but students exercise a good deal of responsibility for their own learning. The relative degree of responsibility or structure depends on the individual student and is usually

determined by the teacher. Contracts typically include statements about the content to be included, a statement of learning objectives, a list of agreed-upon activities, resources to be consulted, a timeline with due dates, and a description of how the work will be evaluated. In general, the student, teacher—and frequently a parent—sign the contract. The student's signature adds a dimension of commitment to the project.

Contracts enable the teacher to give attention to individual student needs and interests. The teacher can also subtly address pacing, a problem in the typical classroom where individual students exhibit different levels of readiness for mastering material. Contracts encourage students to assume responsibility for their own learning, cooperating with the teacher to assess strengths and weaknesses, and to establish learning objectives. Students can develop critical thinking and capitalize on individual learning style as they select activities (Daniel 1991).

Authentic Pedagogy (I-3, T-4)

Authentic pedagogy, developed at the University of Wisconsin, establishes a set of standards by which classroom practice can be evaluated to determine their "authenticity." An examination of the type of mastery demonstrated by successful adults such as scientists, musicians, business entrepreneurs, politicians, craftspeople, attorneys, novelists, nurses, and designers provided the base for the standards (Newmann, Marks, and Gamoran 1995). What people do in the real world as they solve problems, create new knowledge, and resolve controversies serves as the basis for determining the criteria of authentic academic achievement.

The following three principles can be used as a template for determining the degree to which teaching and assessment are worthy of the label "authentic." First, achievement is authentic if it represents or simulates what people in the real world do—construct or produce real knowledge. Second, authentic achievement is grounded in a field of knowledge or in several fields of knowledge; that is, it is rooted in high standards of intellectual quality. Third, it has personal or utilitarian value beyond documenting that a student has simply done something. The achievement must influence an audience, result in a product, or communicate ideas in a way that demonstrates deep understanding of a field. Authentic achievement is similar to what teachers themselves experience when they attempt to teach something to someone else (Newmann, Marks, and Gamoran 1995).

Teachers who practice authentic pedagogy have respect for students' prior knowledge and establish a means to assess it. They emphasize opportunities for higher-order thinking and in-depth understanding. They offer multiple opportunities for students to express what they know in various forms—writing, speaking, building things, painting, and so forth. They serve

as coaches, mentors, facilitators, and guides in a relationship similar to that of a cognitive apprenticeship. Teachers stress collaboration among students and high expectations for intellectual accomplishments. They create learning opportunities to help students develop proficiency in constructing knowledge, disciplined inquiry, and addressing problems that have meaning beyond mere success in school (Newmann, Marks, and Gamoran 1995).

Guided Practice (I-4, T-4)

Guided student learning is widely used in the arts and in athletics. Music teachers and athletic coaches readily spring to mind in this form of pedagogy. Many successful coaches are excellent teachers. Coaching involves a low ratio of coaches to players to provide more personal attention. Coaches work with small groups or one-to-one. They demonstrate what they want players to do, and then watch them carefully as they attempt to do it. The player's performance becomes the assessment, which is rated in terms of an optimal performance. Corrections are made, the assessment repeated, and the performance evaluated again. This process is repeated until the player's skill approaches a predetermined standard.

Joyce and Showers (1982) identify five major functions of coaching. Coaching makes provision for:

1. Companionship—interchange with another human being over a difficult process.
2. Technical feedback—perfecting skills, polishing them, and working through problem areas.
3. Analysis of application—deciding when to use a particular strategy or tactic.
4. Adaptation to players (students)—adjusting the approach to fit the needs, skill level, and background of particular players (students).
5. Personal facilitation—helping players (students) feel good about their efforts as they practice new skills (4).

The translation from the coaching strategy to teaching as coaching involves the students practicing the target behavior under the supervision of the teacher-coach. By asking appropriate questions during the process, teachers gain insight to help optimize the behavior. They might ask students to verbalize the steps they are using. This feedback provides a formative assessment that the teacher-coach may use to suggest subsequent steps. In some cases, students are encouraged to perform a skill or solve a problem as completely as they can on their own so that the teacher-coach can determine the point at which intervention is appropriate. The coaching model is highly personal and, whenever possible, involves teachers working with individuals or a small number of students.

Teacher-coaches provide various kinds of support to students by instructing, modeling, or asking pertinent questions. The supports that coaches provide are adjusted in accordance with student learning characteristics, the nature of the task, and the nature of the material. Scaffolding, a commonly used support, has been described as a “process that enables a child or a novice to solve a problem, carry out a task or achieve a goal which would be beyond the unassisted efforts” (Wood, Bruner, and Ross 1976, 91). A scaffold may be any temporary aid, such as a checklist, outline, or training film. As students move toward the goal and become more self sufficient, scaffolds are gradually removed (“fading”).

Cooperative Learning (I-4, T-4)

Cooperative learning groups are small groups in which students work together to accomplish an academic task. Each student is accountable for both the academic task and the working relationships and procedures of the group. The teacher’s role is to set the task, establish the procedure, encourage a clear interdependency among group members, provide resources, and content as needed and monitor social skills.

Four elements are essential for a small group to be cooperative: Positive interdependence among learners, face-to-face interaction, individual accountability, and interpersonal/small-group skills. David Johnson and Roger Johnson at the University of Minnesota, and Robert Slavin at Johns Hopkins University have developed the most frequently used cooperative learning strategies. The strategies include:

- Student Teams–Achievement Division (STAD) in which students are heterogeneously grouped in four- or five-member teams. The teacher introduces new material by lecture or discussion. Students use worksheets and help one another in pairs. Individual tests contribute to team scores.
- Teams, games, and tournaments, which uses the same teams, instructional format, and worksheets as STAD. Students participate in weekly academic tournaments to show their mastery of subject matter. Competition is organized among equally achieving individuals from different teams with scores contributing to team totals.
- Jigsaw strategy assigns students to six-member teams to work on subject matter divided into five sections (two students share one section). Each student studies his or her section, meets with members of other teams in “expert groups” focused on the section, and teaches the team about the section. Individual tests are administered covering the material.
- Group investigation involves two- to six-member groups who use inquiry methods and group discussion to develop cooperative

projects. Teams choose subtopics from a unit being studied by the entire class, break their subtopics into individual tasks, and prepare a group report for presentation to the class.

Topic Study (I-4, T-4)

Topic study was developed in Scotland by scriptwriter Fred Rendell. Topic study is grounded in the idea that the world is complex and that students have their own ideas about how the world works. The studies begin with a story line, establish a place and time, introduce people or animals, and set up problems to solve. It uses the general strategy of inquiry and discovery. Students learn that ideas are negotiable if they supply evidence to support them. Students who use topic study are participating agents in their own learning (Farnham-Diggory 1992).

Topic study focuses on a theme and usually requires a full semester or two to complete. The thematic approach integrates reading, writing, spelling, mathematics, social studies, literature, science, and the expressive arts. *Whale*, for example, is a topic study created for use with upper elementary and middle level students in Scotland. It contains 10 units. Each unit expands the complexity of the inquiry. Students work directly with primary source material, and teachers help them generate questions that lead to hypotheses, which in turn lead to tentative answers and more questions. Classrooms are transformed into learning laboratories where students immerse themselves in the content and the process of the topic. *Whale* also uses computer technology to broaden the database (Farnham-Diggory 1992).

The process begins with the teacher reading a narrative and leading the class in an in-depth analysis of content. The analysis generates questions that lead to more penetrating questions as students plumb the depths of a topic. Students frequently work in collaborative groups where opportunities to learn from each other abound. Teachers use various tactics such as modeling, coaching, and scaffolding to help students understand complex concepts and posit their own theories.

Perspective from the Present

Any attempt to classify instructional approaches into one category or another must be tenuous. Placement clearly involves subjective judgment. Some approaches probably touch several levels of our typology and depend on the quality of implementation. We postulated four levels primarily to help practitioners gain a sense of the status quo and the scope of developing strategies. Personalized instruction is a direction that schools should take in the new century if the diverse needs of students are to be served. Level one strategies are the first step; level four strategies, the current state of the art. The ideal is surely to develop instructional approaches that acknowledge

diversity among learners so that each learner can find an appropriate pathway to master challenging subject matter and needed skills.

The key to solving most social and motivational problems in today's schools is to alter the learning environments that cause or occasion them. As W. Edward Deming observed, "Either everyone wins, or everyone loses." There is no happy mean here. Personalizing the learning experience brings us closer to this ideal. In *The Right to Learn*, Darling-Hammond (1997) writes, "Building a system of schools that can educate people for contemporary society requires two things U.S. school[s] have never been called upon to do: To teach for understanding and to teach for diversity" (5). The strategies presented here offer schools a practical way to achieve both goals. 🐼

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