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Getting Personal: The Promise of Personalized Learning
Sam Redding

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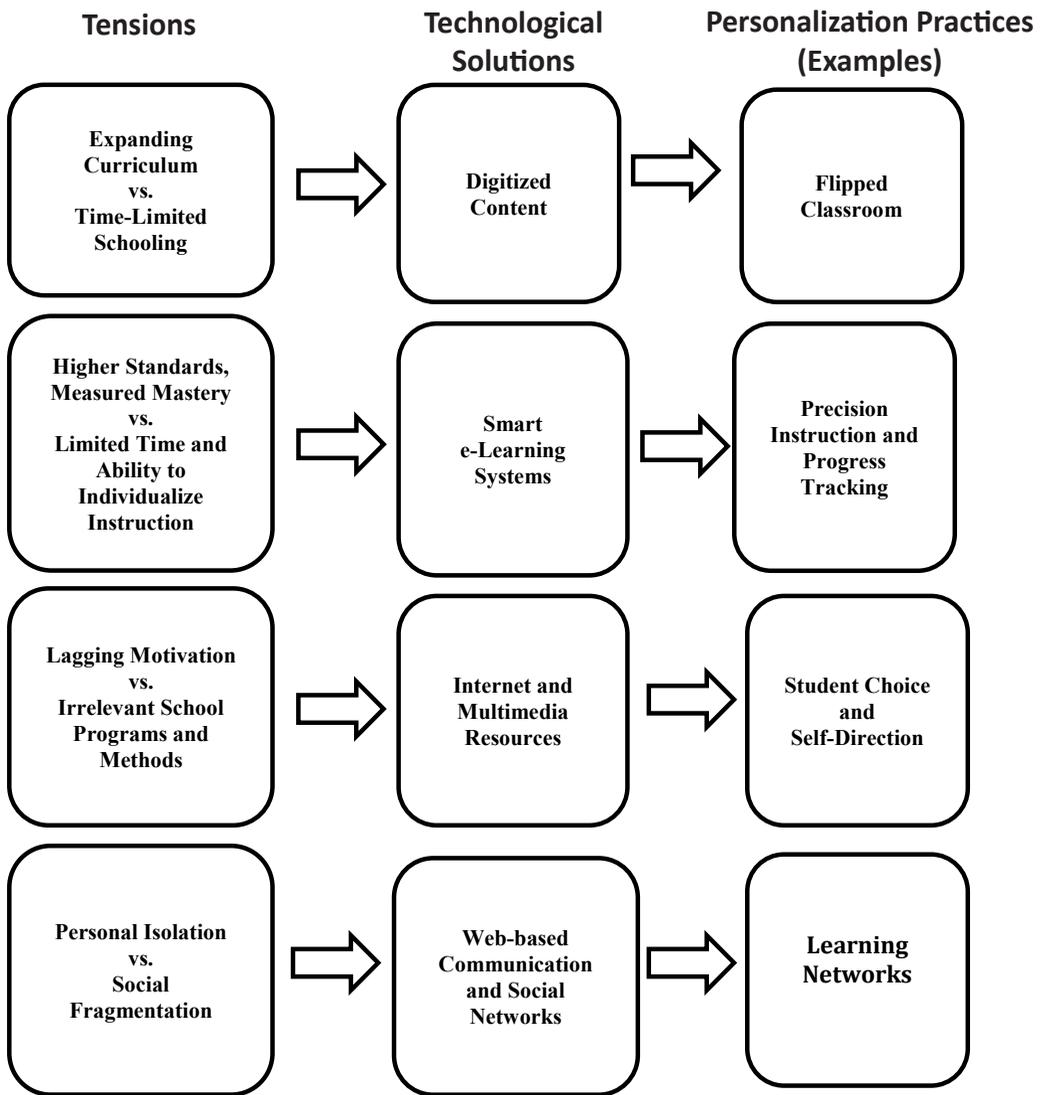# Getting Personal: The Promise of Personalized Learning
Sam Redding

Personalized learning's basic premise—that instruction should be tailored for each student and that the student should be the prime actor in directing learning—is not new. Four tensions in education, however, are reigniting interest in personalized learning:

   a. The curriculum is under pressure to expand in scope and depth, though the amount of time in school remains stubbornly constant (Kaplan & Chan, 2011).

   b. Teachers struggle, given limited time for training and planning, to use data and individualize instruction to meet the expectation that all students perform proficiently on methodically structured, standards-based assessments (Hassel & Hassel, 2012).

   c. Low achievement and unacceptable dropout rates point to waning student motivation as an underlying cause (Christensen, Horn, & Johnson, 2008).

   d. Familial and societal fragmentation and disconnection jeopardize young people's social and emotional well-being (Jackson, 2008).

Accompanying the impetus to address these problems and the resulting revival of interest in personalized learning is the sense that new technologies may actually make such learning feasible. By reforming schooling's time–pace–place traditions and utilizing new technologies, personalized learning proponents assert that the bulging curriculum could be accommodated, data and instruction efficiently managed, students motivated, and people connected. Figure 1 illustrates the problematic tensions in education, the possible technological solutions, and the application of the technologies in the practice of personalization.

Figure 1. Tensions, Technological Solutions, and Personalization Practices

Tensions	Technological Solutions	Personalization Practices (Examples)
Expanding Curriculum vs. Time-Limited Schooling	Digitized Content	Flipped Classroom
Higher Standards, Measured Mastery vs. Limited Time and Ability to Individualize Instruction	Smart e-Learning Systems	Precision Instruction and Progress Tracking
Lagging Motivation vs. Irrelevant School Programs and Methods	Internet and Multimedia Resources	Student Choice and Self-Direction
Personal Isolation vs. Social Fragmentation	Web-based Communication and Social Networks	Learning Networks

New technology makes possible ways to teach and learn that were unfathomable only a short time ago. Approaching technology's multitude of possibilities, we are at once hopeful and cautious. Maggie Jackson (2008) is cautious, asking:

> Do we yearn for such voracious virtual connectivity that others become optional and conversation fades into a lost art? For efficiency's sake, do we split focus so finely that we thrust ourselves in a culture of lost threads? Untethered, have we detached from not only the soil but the sensual richness of our physical selves? Smitten with the virtual, split-split, and nomadic, we are corroding the three pillars of our attention: focus (orienting), judgment (executive function), and awareness (alerting). The costs are steep: we begin to lose trust, depth, and connection in our relations and our thought. (p. 215)

Clearly, technology is not and should not be the whole of personalized learning lest it fail as an antidote to the tensions in education. The expanding curriculum may fracture into incomprehensible, digital disarray. Reliance on radical individualization may rob students of common experience and overlook the proven facility of explicit and direct instruction. Excessive student choice may result in no appreciable unity of understanding and wasted time. Social connection mediated by electronic devices may further isolate young people and hamper social and emotional maturation.

To succeed, personalized learning will have to choose its technology judiciously and adhere to sound principles for how students learn. Frederick Hess advises, "Given our scant experience with digital provision, it seems prudent to avoid sweeping national policies or requirements, at least at this stage" (Hess, 2012, pp. 49, 51). The same caution is appropriate for states, districts, and schools for any introduction of technology.

What, Exactly, Is Personalized Learning?

David Brooks, in his 2011 best seller *The Social Animal*, describes the fictional Ms. Taylor, a high school English teacher whose "goal was to turn her students into autodidacts. She hoped to give her students a taste of the emotional and sensual pleasure discovery brings—the jolt of pleasure you get when you work hard, suffer a bit, and then something clicks" (p. 82). Ms. Taylor sought to press beyond her students' blasé exteriors, discover each one's inner being, and understand what would open his or her mind. She would then think of just the right book for that student at that time.

Ms. Taylor waited to find Harold, a student, alone in the hallway. "She pressed a slim volume into Harold's hand. 'This will lift you to greatness!' she emoted. And in a second she was gone. Harold looked down. It was a used copy of a book called *The Greek Way* by a woman named Edith Hamilton. Harold would remember that moment forever" (p. 83). Ms. Taylor did not stop there. Over the coming weeks, as Harold responded to the book and raised questions that went beyond its scope, Ms. Taylor pointed him to other books and suggested topics for his papers. From Ms. Taylor, Harold learned the discipline of research and the joy of learning. Ms. Taylor took this approach with all of her students, personalizing her instruction.

We can appreciate the principles of personalized learning that Ms. Taylor employed—matching the right content to each student's interests and readiness at just the right moment and extending learning beyond the classroom. You might even say she flipped her classroom, with students reading late into the night and coming to school charged with ideas to discuss. What we might ponder is the extent to which Ms. Taylor's own passion for learning and personal interest in her students contributed to her success as a teacher, apart from the mechanics of paced learning tailored to learning preferences and the interests of the learner.

In other words, can a computer do it better? Or even as well? Perhaps Ms. Taylor, with the aid of technology, strikes the right balance.

Personalized learning is a hot topic these days, raising both hopes and concerns: Is it a fad that will pass or an idea whose time has come? Does personalized learning disregard interpersonal learning? Will personalized learning give us the big jump in student achievement we desperately seek? Does personalized learning mean kids spending more time staring into electronic devices? What, exactly, is personalized learning? Here is how the U.S. Department of Education (USDOE) defines it:

> Personalization refers to instruction that is paced to learning needs [i.e., individualized], tailored to learning preferences [i.e., differentiated], and tailored to the specific interests of different learners. In an environment that is fully personalized, the learning objectives and content as well as the method and pace may all vary. (2010, p. 12)

It is telling that this USDOE definition of personalized learning was put forward in the department's launch of a major technology initiative, a concurrence that illustrates the present-day merger of personalized learning philosophy with technological application. A 2010 symposium on personalized learning sponsored by the Software and Information Industry Association, in collaboration with ASCD (formerly the Association for Supervision and Curriculum Development) and the Council of Chief State School Officers, made the connection between personalization and technology. The symposium's report (Wolf, 2010) states:

> Personalized learning requires not only a shift in the design of schooling, but also a leveraging of modern technologies. Personalization cannot take place at scale without technology. Personalized learning is enabled by smart e-learning systems, which help dynamically track and manage the learning needs of all students, and provide a platform to access myriad engaging learning content, resources, and learning opportunities needed to meet each student's needs everywhere at any time, but which are not all available within the four walls of the traditional classroom. (p. 10)

The symposium advocated as much for the use of technology as for the efficacy of personalized learning, marrying the two to demonstrate technology's power to make personalized learning practical.

The symposium participants identified the top five essential elements of personalized learning as follows:

a. flexible, anytime/everywhere learning;
b. a redefined role for teachers and an expanded sense for "teacher";
c. project-based, authentic learning;
d. a student-driven learning path; and
e. mastery/competency-based progression/pace (Wolf, 2010).

This list of essential elements of personalized learning adds specificity to the USDOE's definition as previously cited. The symposium singled out the redefinition of the use of time and the Carnegie Unit as the "single most significant policy enabler for personalized learning....Personalized learning models reverse the traditional model that views time and place (that is, seat-time) as the constant and achievement as the variable. Instead, personalized learning ensures all students gain proficiency independent of time, place, and pace of learning" (Wolf, 2010, p. 7).

The Ways We Learn

In warping the traditional model for time, pace, and place as suggested by the symposium's identified priorities, personalized learning cannot loosen itself from psychological and behavioral principles of how people learn. In fact, the promise of personalized learning rests heavily on its ability to open our eyes to learning's many paths and choose them wisely. Technology may make this feasible. The following fictional vignettes describe the many ways we learn.

We learn informally and incidentally. Long before Sally steps foot into a classroom, she will learn to speak, walk, identify and categorize hundreds of objects, respond to social cues, and act on her environment. She jumps on her daddy's lap, tilts her little head, smiles, and says, "Petey good doggie. Petey come inside and play with me?" Somehow Sally mastered an immeasurable array of psychomotor, cognitive, and affective skills in order to gain her father's assent. This is informal or incidental learning, and Sally will go on learning in this manner the rest of her life.

We learn through self-directed, intentional study, monitoring our progress and adjusting our strategies. James is bound and determined to get his driver's license. He pours over the *Rules for the Road*, underlining key passages, dog-earing a couple pages, closing the book, and quizzing himself. No one assigned this learning task to James. His learning is self-directed toward a goal he has set for himself, with strategies he has chosen to employ.

We learn when our objectives are explicit and we get plenty of practice. Edna Filbert thinks of herself as an old-school educator. Come hell or high water, no child will leave her second-grade class without solid reading and math skills. "Sure we have fun. Learning is fun. But, by golly, it is the most fun when we know we got it right. My kids know their phonics, and they know their math facts. I drill them in class, and they practice. No such thing as 'drill and kill' in my book. Drilling itself is fun. When I present a flash card and the kids respond in unison with the right answer, I see the smiles on their faces. I like to create verses that include a few new words. We sing the verses together, and the kids get familiar with the words. Then, they spell the words out on their papers, and I quiz them on the meaning. They understand what I want them to learn, and they are happy

when they do it." In Mrs. Filbert's class, personal satisfaction is derived from collective pursuit, a sense of accomplishment, and seeing Mrs. Filbert applaud.

We learn through discovery and acquired relevance. When surfing the Internet to find pictures of her favorite U.S. presidents, Marie inadvertently lands on a site about the Lincoln automobile. Something catches her eye. It is a picture of a woman holding a sketch of a new car design, and in the background is a silver-colored convertible trailing an electric cord plugged into the wall. Marie clicks on the picture to learn more. A video clip explains the elements of the new car design narrated by a young engineer. Marie downloads a brochure on careers in automotive design and engineering. Marie has discovered a new interest and gained new knowledge unrelated to her original search.

We are motivated to learn when our teacher connects personally with us. To most of his teachers, Phillip is an indifferent learner. His math teacher, Miss Alvarez, is not satisfied with that appraisal. "What's planned for your weekend?" Miss Alvarez asks. "Nothing much," Phillip responds. "So what does your Saturday look like?" Miss Alvarez presses. "Helping dad in the store," Phillip replies. "What's the job?" Miss Alvarez inquires. "Pricing and stocking crates of oranges," Phillip offers. "How do you know what price to put on the oranges?" "It depends on how many are spoiled, how many are ripe, and what we think the customers will pay." "Very interesting. So you must have some formulas for making these decisions. Do you sample a few crates to determine the percentage of oranges that are spoiled or ripe?" "Yes, something like that." "And do you calculate what the oranges cost you, including the shipping?" "Of course, we have to make money." "Sounds like you work with a lot of math." "I never thought of it that way." "Well, I think I have an idea for a homework assignment, just for you." Miss Alvarez found a way to make learning personal for Phillip, and Phillip now thinks of Miss Alvarez as different from other teachers—in a good way.

We learn by example as well as through intentional instruction. "I don't know where to draw the line between what I teach by example and what I teach more directly," says Dennis McWhorter. "I like to think that I model the social behaviors that I want my students to emulate, but I also teach them specific social skills. I teach learning strategies, and I also 'think out loud' with the class as we ponder a problem and determine together how best to approach it. We can't take for granted that kids will absorb social and emotional learning by osmosis, and we can't assume they develop metacognitive abilities purely through trial and error." Dennis McWhorter models and teaches social and metacognitive skills.

We learn efficiently when the learning tasks build from our current mastery, stretching us just the right amount. Bill Bostek's fellow teachers call him "Mr. Fanatic." "They think I am obsessed with data and that I work day and night," Bill explains. "I keep telling them that the data are only part of the story. In fact, data are a small part. The big job is in constantly adapting each student's

assignments in response to the data. That is the time-consuming part, but also the part that makes the difference. I have a system for it. Everything I teach is aligned to standards, of course. All the teachers do that. But I am very specific in developing my objectives for what I want the kids to learn. Then I develop several ways for a student to master each objective—multiple learning activities. I embed my assessments in the work, so I can keep making adjustments in what I want each student to do. At least twice a week I make adjustments for each student in each subject. I group and regroup students based on their progress. I pull together a few students for reteaching when I sense they have a common need. Some kids learn quickly, and I feed them more work at a higher level. I don't want them to get bored. Other kids take more time, and I want to be sure they have mastered each objective before moving on. That works for most of them, but for some it seems the school day isn't long enough. I stay after school for what the kids call 'Bostek Hour,' and I tutor them. Sometimes we meet at the school on Saturdays, and I try to make it fun for them. Yes, it is a heck of a lot of work, but it pays off. My students learn. All of my students." Bill Bostek differentiates his instruction and applies mastery learning techniques the old-fashioned way, and that requires an extraordinary amount of planning time and attention to each student's progress, each day. He is a fanatic.

    We learn enthusiastically when we are actively engaged in the process. Cynthia Greenberg is a technology native and knows every new device and software application that comes on the market. Her science classroom is wired to the hilt. "What the old-timers call programmed learning has really evolved," she says. "It is no longer an isolated student plunking through computer screens to make the red light flash. The software I use includes sophisticated algorithms and precisely scaffolds each student's learning path and gives me real-time data on each student's progress. It probes the students to learn their special interests and takes that into account in their assignments. It saves me hours of preparation time. But it also helps me group students for project work, links to videos that the kids love, and encourages discovery. Each student has a folder on our server, and they use word processing programs, spreadsheets, and databases in their work. They snap pictures from the electronic microscopes and include them in their reports. Students use presentation software and embed videos in the presentations they make to the class. Yes, there is a lot of activity in my classroom, but it is all for a purpose. And the progress data for each student lets me know exactly where they are so that I know they are learning science. Cool stuff." Cynthia Greenberg's facility with technology enables her to efficiently incorporate the principles of personalization.

    In summary, much learning is incidental; it just comes naturally. Some learning is self-directed, requiring facility in setting goals, self-assessing mastery, applying learning strategies, using learning tools and technologies, and finding information. Formal learning takes practice, work, repetition, and persistence.

We sometimes acquire new interests by serendipity, discovering realms of knowledge previously unexplored, when we are given choice in directing our learning. When our teacher shows that she really knows us and cares about us, we eagerly accept her instruction and are inspired by her example. We learn vicariously as well as from instruction and study. We pursue learning tenaciously when the task is sufficiently challenging but also within our reach. We invest ourselves fully in learning when given choices in the process. We thrive on variety, and we like to show off what we know. Tapping into these various ways in which we learn, personalized learning, at its best, expands our conception of where, when, and how learning occurs.

The term "personalized learning" begs the question: Who does the personalizing? The examples of the ways we learn (cited above) include student-driven

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learning processes in which the student chooses the topic, time, strategy, and outcome. Other examples place the teacher in the dominant role, designing instruction and adapting it to each student. School-based personalized learning models typically include both personalization by the teacher and by the student. These models include individual student work as well as group work. Technology may be an aid to both the teacher and the student. Technology enables teachers to efficiently manage curriculum, precisely assess each student's mastery, organize multiple paths to mastery, assign learning tasks aligned with each student's interests and readiness, communicate with each student, and present instruction through a variety of modes. Technology enables students to manage their work; learn outside the school; self-assess their mastery; conveniently access resources; communicate with the teacher, other students, and other teachers and experts; and present and share their work in a variety of modes.

Research Synthesis

Personalized learning, as the term is used today, rests upon strands of education philosophy and methodology with a considerable lineage. Research on personalized learning, then, derives from studies relevant to its individual strands or on specific applications of elements of its approach.

Personalized Learning's Pedigree

Despite the current emphasis on technology as the chief enabler of personalized learning, the concept has a lengthy pedigree that predates the digital age. Its predecessors chipped away the lock-step approach to education, likened to factory production lines, that arose in the nineteenth century when bureaucratic public school systems emerged and emulated industrial age business practices (Jeynes, 2007). Ironically, the standardized, assembly line model replaced, in

many regions, one-room schoolhouses that operated in accordance with some of the principles we now ascribe to personalized learning—minus, of course, the technology.

Personalized learning theories today are infused with educational philosophy from the Progressive Era, especially John Dewey's (1915, 1998) emphasis on experiential, child-centered learning; social learning; expansion of the curriculum; and preparation for a changing world. The expansionist, progressive philosophy is counterbalanced in contemporary personalized learning approaches by the science of education introduced by Lee Cronbach (1949), Benjamin Bloom (Bloom & Krathwohl, 1956), and others in the mid-twentieth century, who advocated the careful measurement of student mastery of predetermined objectives. This scientific approach took full flight in the standards movement of the late-twentieth century. Technology is viewed by personalized learning advocates as the necessary linchpin to efficiently wed an expanded curriculum and varied instructional modes with the exacting requirements of learning standards and assessed student mastery (Wolf, 2010).

Personalized learning, as recently defined by the U.S. Department of Education, is a concept advanced from those of individualization and differentiation. Individualized instruction is paced according to the learning needs of different learners, as in mastery learning (Bloom, 1971). Differentiated instruction is tailored to the learning preferences of different learners and guided by what research shows is best for students like them (Tomlinson, Brimijoin, & Narvaez, 2008). Personalized instruction encompasses both individualization and differentiation, adapting for both pace and preference. Personalized instruction also adapts learning objectives and content as well as method and pace, remaining cognizant of the objectives' relationship to content standards (USDOE, 2012).

Margaret C. Wang combined aspects of differentiation and mastery learning in a teacher-planned approach that included student self-direction in managing learning tasks. Wang's Adaptive Learning Environments Model (ALEM; Wang, 1992) was designed to meet the challenges of diverse student backgrounds, interests, and prior learning that increasingly characterized classrooms in public schools. Especially, ALEM addressed the diversity propelled by inclusion of students with disabilities in regular classrooms. Wang proposed meticulously planned, differentiated learning activities assigned to each student through fluid "prescriptions" (student learning plans) that the teacher modified on-the-fly as students demonstrated mastery of leveled objectives. The ALEM classroom was organized into learning centers, and students self-scheduled their rotations through the centers as they worked on their individual plans. The student learning plans included both independent work and group work. The teacher introduced new material in whole-class, direct instruction and reinforced it in teacher-directed small groups. ALEM included most of the elements of personalized instruction but required an immense amount of teacher preparation, which

Wang suggested was best done by teacher instructional teams.

Mastery learning (Bloom, 1971) shattered the time barriers teachers placed on the acquisition of teacher-determined objectives—more time for some students, less for others, until the objectives were met. Differentiated instruction (Tomlinson, Brimijoin, & Narvaez, 2008) paved multiple pathways to the same objective, and adaptive learning (Wang, 1992) insisted that the teacher adapt her objectives, activities, classroom configurations, and modes of instruction in accordance with the assessed readiness of each student. Together, these concepts set the stage for technology's ability to provide wide-ranging and audience-specific content and to gather and manage data. Technology has the potential to make practical the management of curriculum, instructional differentiation, and assessment of mastery required to personalize learning: "Digital learning makes it easier to personalize instruction, which many average teachers find difficult or impossible to achieve with whole classrooms of students with a wide array of needs" (Hassel & Hassel, 2012, p. 13).

Technology in Personalized Learning

The concept of personalized learning predates the introduction of technology to facilitate its practice, but technology may provide the means for doing it well. "Personalization has and can take place without technology, but not at scale. Technology dramatically increases a teacher's ability to identify and manage the needs of many students, and for students to access a large variety of interventions, content, resources, and learning opportunities everywhere at any time" (Wolf, 2010, p. 10). Technology provides more efficient ways to personalize (Crosbie & Kelly, 1993). Technology can assist in all areas of teaching and learning, including (a) initial student assessment to determine current strengths, weaknesses, and needs; (b) selecting, aligning, and managing curriculum; (c) managing student profile data to document individual needs, preferences, and interests; (d) assessing student mastery to inform instruction; (e) creating multiple, teacher-prepared lessons for targeting individual student needs, preferences, and interests; (f) delivering media-rich instruction; (g) giving students access to resources and an interactive network of teachers and students; (h) aiding students in project development and presentation; (i) providing computer-based, computer-assisted, and online learning; and (j) providing teachers, administrators, parents, and students with a wealth of data-based metrics and analytics reporting individual student learning as well as classroom, school, district, and state progress and performance.

Personalized learning requires a shift not only in the design of schooling (i.e., time, curriculum, and instructional delivery methods), but also in how educators view and use technologies. When judiciously selected and appropriately implemented, technologies can enhance efforts to personalize instruction through (a) smart e-learning management systems that can dynamically track and manage

the learning needs of individual students and whole classrooms; (b) intelligent, automated tutoring systems that provide immediate and customized coaching, feedback, and ongoing performance assessments to students; (c) platforms that allow students to connect with engaging learning content; (d) access to real-time, up-to-date resources and learning opportunities that engage learners and meet individual learning needs anywhere and anytime; (e) expanded assessment opportunities; and (f) learning communities extending beyond the classroom (Dede & Richards, 2012; Wolf, 2010).

For some students, personalized learning may include online classes. In a blended learning approach, technology is not seen as a replacement for the traditional classroom, but rather as a powerful tool to enhance what is already proven to be effective pedagogy. "In this hybrid conception of personalization, educators can carry out a series of practices to make sure that technology and data enhance relationships, but do not pretend to substitute for them" (Sandler, 2012, p. 1). For other students, technology may simply make classroom learning activities more viable. For example, a project at Temple University Institute for Schools and Society (ISS) is developing an iPad application that may enable students with learning disabilities to take better class notes. This technological innovation can improve students' abilities to learn through better knowledge transfer.

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21st-Century Skills

The 21st-century skills model, advocated by Bernie Trilling and Charles Fadel (2009), has been adopted by school districts across the country over the past few years. This model contains many of the elements associated with personalized learning, especially the use of technology to manage an expanded curriculum, options and choices for students, and attention to the complex of personal, social, and academic competencies necessary for success in life. A framework for learning, based on the model and advocated by the Partnership for 21st Century Skills (www.p21.org), combines core subjects with current, interdisciplinary themes: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy; health literacy; and environmental literacy.

In the framework , the thematic approach aims at developing students' 21st-century skills, itemized as:

1. Learning and innovation skills
   a. creativity and innovation
   b. critical thinking and problem solving
   c. communication and collaboration

2. Information, media, and technology skills
   a. information literacy
   b. media literacy
   c. ICT (information, communication, and technology) literacy
3. Life and career skills
   a. flexibility and adaptability
   b. initiative and self-direction
   c. social and cross-cultural skills
   d. productivity and accountability
   e. leadership and responsibility (Partnership for 21st Century Skills, n.d.)

According to its developers, the framework's support systems "help students master the multidimensional abilities that will be required of them" (para. 1). The 21st-century skills model seeks to expand and integrate the curriculum, build personal skills, and utilize technology as an instructional tool and to equip students to succeed in an increasingly technological world.

Direct, Explicit Instruction and Personalized Learning

Personalized learning proponents do not so much disparage direct and explicit instruction as ignore it. When direct instruction is mentioned, it is contrasted with personalized learning. On their blog, "Personalize Learning," McClaskey and Bray (2012) say this: "Traditional teaching practice usually involves explicit direct instruction. In this case, everything depends on the teacher, the hardest working person in the classroom. To really learn something, the learner needs to be challenged and motivated enough to want to learn" (para. 5). In other words, direct instruction is teacher-centered (a bad thing in personalized learning) and does not engage or motivate students.

In fact, direct instruction's central tenet is that the teacher is responsible for what the student learns. Rather than warping the time–pace–place structure of schooling, direct instruction makes maximum use of every available instructional minute through the teacher's meticulous planning and efficient delivery of instruction to the whole class or group of students. The direct instruction model (Adams & Engleman, 1996) centers on seven major steps:

1. The teacher clearly determines learning intentions—what is to be learned.
2. The teacher establishes the success criteria for student performance.
3. The teacher "hooks" the students' interest to build commitment and engagement.
4. The teacher presents the lesson with modeling, input, and checking for understanding before proceeding, reteaching when necessary.
5. The teacher gives students guided practice activities and moves about the room to determine mastery and provide feedback.
6. The teacher provides closure for the lesson, summarizing and drawing together loose ends.

7. The teacher assigns independent practice to reinforce what the students have mastered.

Despite its indifference for most of the tenets of personalized learning, direct, explicit instruction has demonstrated significant results in student learning outcomes. John Hattie (2009), in his much-cited *Visible Learning*, synthesized 800 meta-analyses relating to achievement, showing the effective size of dozens of education practices and influences. In commenting on the massive, federally funded Project Follow Through, a controlled study completed in the 1970s that evaluated the effects on student learning of several programs, Hattie observed, "All but one program had close to zero effects (some had negative effects). Only Direct Instruction had positive effects on basic skills, on deeper comprehension measures, on social measures, and on affective measures" (p. 258). The programs that achieved little or no effect included ones with strong similarities to personalized learning, characterizing themselves as "holistic," "student-centered learning," "learning-to-learn," "active learning," "cooperative education," and "whole language." In introducing direct instruction, Hattie adds a personal note:

> Every year I present lectures to teacher education students and find that they are already indoctrinated with the mantra 'constructivism good, direct instruction bad.' When I show them the results of these meta-analyses, they are stunned, and they often become angry at having been given an agreed [upon] set of truths and commandments against direct instruction. (p. 204)

Further support for direct instruction comes from an analysis of comprehensive school reform models by the Comprehensive School Reform Quality Center (CSRQC; 2006a, 2006b) at the American Institutes for Research. That study found only two elementary school models, both instructionally focused, prescriptive, and based on direct instruction methodology, to show moderate strength of effect. CSRQC found no middle school or high school models with evaluations that showed moderate strength of effect. No models at any grade level demonstrated a strong effect.

One wonders if direct instruction could be woven into a personalized learning model, and certainly digital learning could be utilized in several of direct learning's steps. In addition to direct instruction's structured methodology, the process places the person of the teacher in a primary relationship with students. In understanding what motivates students to learn, separating the personal contributions of the teacher from the methods the teacher employs requires careful dicing of variables. As teachers step aside for a facilitative role and rely more heavily on technology in instruction, we must consider what may be lost.

Personalization at Home

If there is one venue where personalized learning should be natural it is in homeschooling, and we have evidence that many homeschooled youngsters develop an enviable sense of self-direction and academic attainment (Ray, 2010).

When provided by savvy parents, homeschooling also enables flexible adaptation of instruction that incorporates the student's interests and nurtures incipient talent. Homeschooling parents have used digital learning and internet-based programs to provide the meat of instructional content and to determine their children's progress. Homeschooling is the ultimate transformation of schooling's time–pace–place structures and provides a fertile laboratory for understanding what is most promising about personalized learning.

Conclusions

Personalized learning traces its philosophical roots to strands of American education that have attempted to break the lock-step of graded classrooms and rigid curricula, integrate school learning and life experience, and equip the student with the skills necessary for self-directed learning and choice in learning pathways. Yet many of the previous efforts to achieve these aims have fallen fallow because of the time required for teachers to plan and deliver individualized and varied instruction within the confines of class periods and curricular requirements. New technology provides efficiencies for the teacher and greater opportunity for both the teacher and the student. Technology and technology-assisted programs, especially those that utilize the internet, engage students with learning in ways that enhance student motivation to learn and provide valuable and frequent feedback on their mastery.

> *Personalization ensues from the relationships among teachers and learners and the teacher's orchestration of multiple means for enhancing every aspect of each student's learning and development.*

Personalization ensues from the relationships among teachers and learners and the teacher's orchestration of multiple means for enhancing every aspect of each student's learning and development. Even with the application of technology to achieve the goals of personalization, the teacher remains a source of motivation for students through her relational suasion with them. The teacher builds the student's metacognitive competencies to effectively direct his own learning and make choices about it. The teacher models and instructs social and emotional learning and behavior. The teacher fosters a classroom culture in which learning and learners are respected, and the thrill of mastery is reinforced. Most of all, the teacher organizes and orchestrates instruction in the ways most effective for each of her students. Personalized learning places the teacher in a multidimensional role that requires a basket of skills and mindsets that honor the supremacy of her position in students' learning.

Action Principles

For the State Education Agency

    a. Remove statutory and regulatory barriers that constrict a district's or school's ability to modify the time–pace–place structure of learning.

    b. Provide information for districts and schools on emerging personalization practices that show promise.

    c. Showcase districts that systematically and effectively utilize personalized learning methods.

    d. Include preparation in personalized learning concepts and methods in leader and teacher licensure requirements.

    e. Provide districts and schools with evaluative criteria to determine the effectiveness of personalized learning methods in their contexts.

For the Local Education Agency

    a. Be cautious of programs described as "personalized"; the term is being used in various ways, so be sure the program fits your purposes.

    b. Give parents a choice in selecting schools and programs, especially when introducing dramatically new methods that some parents may not desire for their children.

    c. Provide technology for administrators and teachers to manage curriculum, instruction, student data, and communication.

    d. Provide ample professional development for school leaders and teachers to successfully integrate technology and personalization methods into their instruction.

    e. Consider the time–pace–place structures in the schools and how they can be changed to promote learning any time and everywhere.

For the School and Classroom

    a. Provide teachers with bridges between conventional teaching methods and personalized methods (especially with technology) to allow them to assimilate the different ways of teaching.

    b. Begin, as they say, with the end in mind—what you want students to acquire—and then consider if the new method or new technology is a better way to achieve the result.

    c. When asking students to use technology outside of school, ensure that all students have access to the technology and know how to use it.

    d. Balance the use of technology to facilitate communication among students and teachers with the need for face-to-face interaction.

    e. Consider both technological and non-technological ways to tailor instruction for each student and to give students choice in directing their learning.

f. Intentionally build students' skills with metacognition, self-direction, and use of multiple sources of information.

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