

Going Beyond Gutenberg and Skinner

By Joseph S. Renzulli

There are conferences for just about everything these days, but because of my interest in personalized learning, it appeared that this one on *redesigning* personalized learning would be just the ticket for gaining new insights into how learning can be more responsive to the divergent needs and diverse populations in today's schools. Most educators agree that the one-size-fits-all curriculum needs addressing, and this by-invitation-only "summit" showed so much promise that I wangled an invite. Resplendent with all the buzzwords of the personalization and differentiation mystique ("flexible," "student-driven," "authentic," "everywhere learning," "systemic redesign"—to mention a few), the event would be staffed by the gurus of school reform and attended by education power brokers and CEOs from the public and private sectors.

Wow! That could be more appealing and hopeful for a change from the harmful direction that education has taken since the No Child Left Behind Act turned the learning process into a gigantic text-consumption and weakness-based test-prep industry? And the expectation that technology was a major answer to this promise of a revolution in personalizing learning made the conference even more appealing.

The emergence of technology in education has certainly created a renewed interest in personalizing learning and providing teachers with the tools necessary for differentiating curriculum. Early efforts to use technology to personalize learning can be traced back to B.F. Skinner's teaching machines, which were designed to use rote-and-drill to automate the task of programmed instruction. Get the correct answer and you moved on to the next question. A wrong answer recycled the student through more practice material until he or she answered the question correctly.

Teaching machines were another failure in the long history of so-called "innovations" in education, but when computers and the Internet came along we seemed poised to capitalize on the technology that placed vast amounts of the world's knowledge at students' fingertips. Just as Gutenberg revolutionized access to knowledge, at least for the restricted number of scholars at his time, we now have the capacity to make knowledge public for anyone who can read and log in.

It soon became clear that the general focus of the conference was on basic curriculum competencies and more-efficient procedures for mastery and improved achievement test scores. Now, rather than covering material in a lock-step fashion for all students at the same time, teachers can direct content at different levels to students according to their varied achievement levels. Although this use of technology extends (by a giant step) the traditional one-size-fits-all instructional model, it only accounts for varying competency levels rather than examining at least three other categories of learner characteristics that define true personalization. This restricted focus led me to conclude that we are using today's technology for what might be called "Gutenberg-online"—the electronic shuffling of worksheets and standard-text material—and that, pedagogically, we haven't progressed much beyond the type of learning that Skinner advocated with his teaching machines.

A similar case can be made for the explosion of online courses currently available to school-age students. These courses have great value when not available locally, but they almost always follow a linear, sequential instructional model rather than a more inductive and investigative model of learning. To paraphrase Gertrude Stein, a course is a course is a course, or in education-speak: Standards-driven prescriptive material is geared toward answering the questions at the end of the chapter and taking another achievement test. Skinner's teaching machine movement failed because we're treating students like Pavlov's dogs. We could face the same consequences with today's technology unless we expand our vision about what personalization could be and how technology can help make it happen.

True personalization requires more than just looking at achievement levels and trying to compensate for deficiencies. At least three other characteristics of the learner and differentiation of content and process are necessary to give us a more comprehensive profile of student potentials and point us in the direction of making modifications in the learning process. In addition to achievement levels, information about student interests, learning styles, and preferred modes of expression allow us to make decisions about personalization that take multiple dimensions of the learner into account.

This information can easily be gathered and analyzed through the use of computer-generated profiles and from search engines that match multiple categorized resources from databanks containing vast quantities of highly interactive online material. Teachers can use this technology to infuse into and all standards-driven curriculum highly engaging enrichment materials that can make any lesson or unit of study more exciting, engaging, and enjoyable. Math concepts improve and become more relevant when students use technology to design and build their own roller coaster. Students can gain a greater appreciation and understanding of ancient Egyptian culture when they do a virtual dissection and preservation of their own mummy.

The differentiation of content requires adding more depth and complexity to the curriculum rather than transmitting more or easier factual material. By focusing on structures of knowledge, basic principles, functional concepts, and methods of inquiry in particular disciplines, students are prepared to assume roles as firsthand inquirers rather than mere consumers of information. The differentiation of process requires the use of a variety of instructional strategies that differ from the traditional deductive, didactic, prescriptive approach in most classrooms. Respect for learning-style variations can be achieved by using instructional strategies such as simulations,

Socratic inquiry, problem-based learning, dramatizations, and individual and small-group investigations of real problems. Expression-style preferences can be accommodated by giving students opportunities to communicate visually, graphically, artistically, and through animatronics, multimedia, and various community-service involvements.

The biggest enemies of differentiation are time and the over-prescription of learning. Before the availability of computers and the Internet, teachers simply did not have the time to find and direct customized resources to individual students.

Our obsession with content mastery and Skinner's behavioral theory of learning are slowly but surely giving way to an interest in personalization and differentiation. While it is understandable that our early use of technology was mainly an adaptation of Gutenberg-online and a teaching machine mentality of what learning is all about, we now have both the pedagogical rationale and technological capability to use the many dimensions of student characteristics that clearly and unequivocally result in higher engagement, enjoyment, and enthusiasm for learning.

Amazon and Netflix know that we like to read and view, and they make use of this information to "differentiate" the material they send us. We can do the same thing to enrich the entire learning environment by capitalizing on a broader spectrum of learner characteristics, creating comprehensive computer-generated student profiles, and using the interactive capabilities of today's technology to revitalize learning. By so doing, we can minimize boredom and make learning the challenging, enjoyable, and relevant process that it should be.