

Educational Technology Points of Inflection

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Individualization in Learning: A Key Point of Inflection

Introduction: Many Choices for Consumers, Very Few for Our Students

A stay on the campus of Notre Dame University can be an exhilarating experience for students there or even for visitors who come for a short stay. Whether attending classes, contemplating the “Touchdown Jesus” mural from the seats of the famous football stadium, studying in the Hesburgh Library on which the mural is located, or attending a conference, as I did last summer, the lessons learned can be many and varied.

The particular insight I gained there came during the annual symposium of the Computer Assisted Language Instruction Consortium (CALICO). Rather than resulting from listening to a presentation in a lecture hall or reading in the library, however, my insight came after a delightful bike ride along the St. Joseph River in South Bend, Indiana.

At the end of my ride and just before returning to the dorm, I stopped for dinner at Five Guys Burgers & Fries in the Eddy Street Commons, just off the south side of the



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campus. My insight was not new. Rather, it was a renewal of a sense I had gained in my readings over 40 years ago, beginning first with Alvin Toffler’s *Future Shock* as an undergraduate and continuing with other works in graduate school (George Leonard’s *Education and Ecstasy*, Toffler’s *Third Wave*) as well as for several years afterwards through other varied works and comments from writers like architect R. Buckminster Fuller and science fiction icon Isaac Asimov. They all asserted that our educational system was created to solve the problems of ages past.

Standing in front of Coca-Cola’s newfangled FreeStyle drink machine at Five Guys, it dawned on me that individualization had reached a level not even imagined by the writers who had inspired me. Quoting McLuhan, Toffler wrote, “When automated electronic production reaches full potential, it will be just about as cheap to turn out a million differing objects as a million exact duplicates” (Toffler, 1970, p. 238).

I stood there for a moment, contemplating the choices before me, “Should it be Sprite with cherry, Barq’s Root Beer with vanilla, or perhaps strawberry Minute Maid Lemonade?” I can’t remember which I chose. Indeed, it might well have something far less exotic than the choices available. In fact, it could have been Coke with cherry, which is actually available on the typical supermarket shelf from 12-ounce cans to 2-liter bottles, all labeled, “Cherry Coke,” itself a function of the market demassification predicted by Toffler. All we had when I was a kid was Seven-Up, Coke, and Pepsi. Oh, let’s not forget that Southern favorite, Royal Crown Cola, usually referred to as RC Cola, or that Texas favorite, Dr. Pepper.

As the multi-flavored, carbonated concoction flowed into my cup, a sense of *déjà-vu* invaded my consciousness. There I was, in attendance at a conference with many sessions discussing the benefits of technology in education, and here I was about to partake of individualization that even surpassed what McLuhan had predicted. The product did not even exist at the time of purchase and was actually being “manufactured” as the machine delivered the liquids to my cup.

Coca-Cola’s Website heralds their new innovation: “Not since the days of the friendly neighborhood soda jerk have so many people fallen in love with a beverage dispenser.” Despite the market-speak, the message is a clear one: A consumer can now walk into any one of thousands of locations and choose from 100+ combinations of flavors. The machines are not only synched with Twitter (@ccfreestyle) but also consumers can provide Facebook with location information and see a map of stores where the machines are located.

Returning to what has become the first of several encounters with FreeStyle, I watched my cup fill with whatever individualized blend of flavors I had selected and thought of my grandkids, several of them having just finished their school year. What sort of choices have they had in their schooling? How many “flavors of education” were actually available in each of their classrooms? The lesson is clear: The tastes of purchasers of soft drinks are now much better met than the individual needs of students in our schools today.

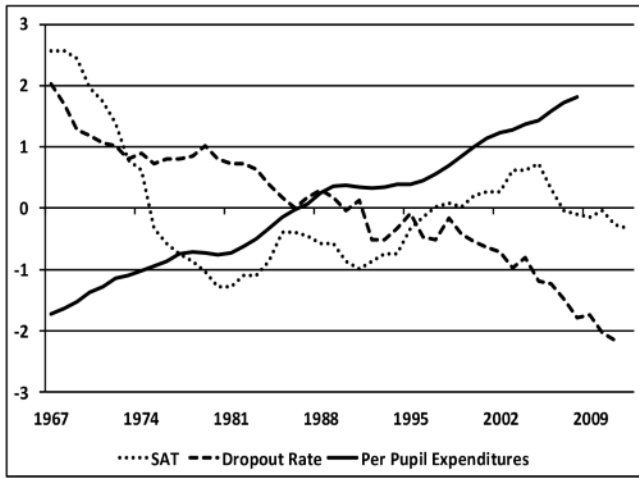


Figure 1. SAT scores, school dropout rates, and per pupil expenditures displayed on a standardized scale.

So Saith the Soothsayer...

With respect to consumer tastes, the predictions by McLuhan and Toffler were spot on, but for education? Not so much! After stating that education had been organized for the “mass production of basically standardized educational packages” (1970 p. 271) Toffler wrote, “One basic complaint of the student is that he is not treated as an individual, that he is served up an undifferentiated gruel, rather than a personalized product” (p. 271). He then predicted:

Long before the year 2000, the entire antiquated structure of degrees, majors, and credits will be a shambles. No two students will move along exactly the same educational track. For the students now pressuring higher education to destandardize, to move toward super-industrial diversity, will win their battle (p. 271).

So what has happened since Toffler’s optimistic educational prognostication? Can we say today that the needs of the individual are being met and that the old system is in shambles? The shambles part essentially connects with the report by President Reagan’s National Commission on Excellence in Education, *A Nation at Risk* (1983), which described the country’s educational system: “If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war” (p. 5).

To go beyond the negative and mostly subjective assessments that have echoed those sentiments, I created **Figure 1** with SAT data from the College Board (2012) along with pertinent information from the National Center for Education Statistics (Snyder & Dillow, 2012). To facilitate comparison on a single chart of the disparate variables, I standardized the three variables over the time period from 1967 to 2008, 2011, or 2012.

Despite significant increases in spending, the learning outcome of our students as measured by SATs has clearly not kept pace. To be a bit more specific, average educa-

tion expenditures per pupil rose from \$3,903 in 1967 to \$10,694 in 2008, stated in 2008–2009 dollars. Even more startling is the fact that the average expenditure per pupil had already increased almost nine times by 1967, from \$454 in 1919, with a total increase of over 24 times from 1919 to 2008!

On the more positive side, based on the data from which the graphic was created, the number of pupils per teacher in the public schools declined from 22.3 in 1970 to 15.4 in 2009, while the number of dropouts decreased from 17% in 1967 to 7.1% in 2011. The assumption that the decreased dropout rate is the result of this improvement in the pupil to teacher ratio is an easy one to make: An improved student to teacher ratio will create the opportunity for increased attention to the individual needs of students, which could well reduce the number of students who drop out of school.

It is worth noting, however, that the escalating per pupil expenditures as seen in **Figure 1** demonstrate how expensive it is to reduce this ratio. This raises the distinct possibility that increasing these expenditures could crowd out initiatives to add technological enhancements that are better suited to learner-centered education than simply adding more teachers. Indeed, this type of change might well improve learning outcomes in a way not reflected in the SAT results in **Figure 1**, which clearly shows that these scores have not at all followed substantial increases in spending.

As positive as these numbers might appear, there is more to the story. The College Board announced last fall that only 43% of college-bound seniors are college-ready. College Board president Gaston Caperton said that “Our nation’s future depends on the strength of our education system. When less than half of kids who want to go to college are prepared to do so, that system is failing” (College Board, 2012b). Next, the City College of New York announced that 80% of their students come to them unable to read at the college level and “need to re-learn basic skills” (CBS New York, 2013). Creativity expert Sir Ken Robinson (2006) believes the problem is worse than that, maintaining that schools needlessly sacrifice the creativity of children everywhere:

We stigmatize mistakes. And we’re now running national education systems where mistakes are the worst thing you can make. And the result is that we are educating people out of their creative capacities.

Conclusion

Many people recognize that education must change. Call it education reform, school transformation, or whatever, but the suggested changes must include attention to individual needs akin to how the FreeStyle machine responded to my tastes for a dinner beverage. Bluntly stated, the instruction provided in any classroom probably only addresses the individual needs of one-third of the students. One-third of the students are either bored to varying degrees simply because they are not being challenged, and a significant portion of the remaining third are at any given moment unsure of what the teacher is talking about.

Some experts propose to address the problem with

“personalization,” others with “differentiation,” and still others with “individualization,” once again demonstrating the profession’s affinity for “buzzwords” that seem to say the same thing and need to be explained by those same experts. To do that without also providing an implementable solution that surpasses the status quo is nothing short of depressing.

Yet, writers like Toffler, Asimov, and Fuller among others say change is necessary simply because schools today are not up to the challenge of the Information Age. The schools date from a time when collective protection for children was needed on the American frontier or when former farmers needed to learn to do boring, repetitive tasks in the expanding factories of the Industrial Revolution.

Harsh assessments aside, we absolutely must move beyond a system geared to students who “succeed” without individual attention, to whom too often we teach canned answers to questions. The objective should be to help all students hold on to their creativity, not fear failure, and be wise enough to determine which questions should in fact be answered. Schools must also provide the tools necessary for that endeavor. The resulting success at addressing individual needs in the learning process will constitute a **point of inflection** on the development curve of educational technology.

We will next discuss the role that educational technology can play in increasing the role of individualization in education and the design principles that will facilitate system development and implementation toward that end. □

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New Issues, New Answers

Marc Prensky

Want the Best Network? Use the Students to Build It!

We are completely ignoring our best technology resource: Our kids could give us the best technology network in the world—if we would enable them!

A Powerful Resource

Anyone who has had any real contact with kids these days (i.e., outside of our rigid schools with their testing-oriented classrooms) knows how excited, smart, and capable today’s young people can be—especially around technology, and particularly when properly challenged.

Our school-age kids are, in fact, our very best resource for getting many things we need done—it’s hard to beat the combination of capable, low-cost, and enthusiastic!

So how could we channel and make use of this powerful resource?

A New Perspective

If we change our perspective about kids for a moment—from that of students competing individually with each other for grades (and for places in college and in life) to one of a powerful cohort working together to accomplish goals useful to all—answers begin popping out at us.

Perhaps the easiest and most useful challenge we could give this cohort would be to make the U.S.’s (or whatever country does this) technology network for education the very best in the world.

How could students do that? Doesn’t a great technology network require professionals? Big companies? Big investments? ADULTS, in short?

I don’t think so. The adults and the technology companies would need to be involved, of course, but they don’t have to be the drivers, or even the doers. The kids can be.

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