Rethinking the Student-Centered Classroom

Personalization and the Type II Application of Technology

Education | Evolving
www.educationevolving.org

January 2008

Foreword to the Education|Evolving Edition

Evoking the Essence of the One-Room Schoolhouse

Liberty, cooperation, self-reliance, and choice

The following essay *Rethinking the Student-Centered Classroom* sets forth to describe how, through proper understanding of the nature of modern technologies, classrooms can become increasingly personalized for the student. This can be thought of in one small way as going back to the ways of the old one-room school house in rural communities: a model that, serving an assortment of ages and abilities was required by its very diverse nature to be personal.

I see the essence of the one-room schoolhouse as including, in part, liberty, cooperation, self-reliance, and choice.

Liberty is elemental. Motivation—for students, for teachers—is fundamental to performance, and liberty underlies that. For a young person motivation in school can come through choice and self-determination, though there are always a few who are most comfortable, and perform reasonably well, by being told what to do. In today's classroom teachers and students are artificially limited; confined within an authoritarian structure of batch processing, centralized authority, and standardization. We seem to have lost sight of the fact that satisfaction in teaching and learning comes not through the end product of the process—a diploma, final grades, moving up to the next grade—but in the pursuit of that goal and wider personal/professional gains.

Patrick Hayden of Victoria University in Wellington, England, spoke eloquently on this in an essay on John Mill. "Happiness," he wrote, "cannot result from seeking pleasure as an end in itself, but must result from the pursuit of other, higher goals. The indispensable value of liberty consists of the benefits derived from allowing individuals to make their own choices as to which paths in life to take. In making their own choices in life, individuals are able to develop to the fullest extent possible their human capacities and in doing so achieve personal self-realization." The need for liberty, while understood in American civic life, has not transcended in the same manner to the institution of mainstream public schooling.

Cooperation within the one-room school included, firstly, interactions between students of different grades and abilities. Older students would assist the younger in reading and math, as was also the case among differing abilities. Everyone would move together in a loosely cooperative sense. The second realm of cooperation was between students and their teacher, who acted not just as a lecturer, but also as a coach.

The self-reliance of a one-room school has not transferred into our current model. Students are supposed to study on their own, but its no secret that few do. They are not encouraged by school; even the well-intentioned have trouble finding any sort of motivating influences. Success does, for the most part, depend on how 'disciplined' a student is, or how disciplining their parents are. This works out for some, but not most. Young people would do well if they had more room to work, in and out of school, on things that interest them. It would help to have an educator as a coach.

School choice is now an eclectic term. Beyond choosing the building or district, students and teachers now have options in structure and pedagogical model. Charters and in-district alternatives provide for new modes of governance, themed curriculum, and targeted methods of instruction.

Would a Type II school as discussed in this essay be like one-room schoolhouses? Should we head this direction? Literally, no. Structurally, yes—at least in theme. Students should be more a part of the educating process, with greater liberty and self-determination.

There are a lot of bored kids in America's classrooms. This is a shame, because outside of schools we have the most creative, resourceful, and energetic citizenry of any civilization in history. Students are bored because they sit in a desk and listen to an adult all day; they are bored because the work is either too hard or too easy (for very few is the pace ever 'just right'), and they are bored because there is little flexibility to spend more time and energy on those subjects that interest them most. Everybody is expected to learn the same material, at the same pace. There is not much educators can do. If a teacher lectures to the top students, she will lose everyone else—nobody wants to do this. If she calibrates to the underperformers, the brighter students are left behind in their own way. This is a challenge facing the top students of color in urban classrooms: their learning is inhibited, often, by the lowest common denominator. We need to help those students that are not now succeeding, but must also ensure that the more capable students—especially African American and Hispanic—are not being held back.

Ted Kolderie speaks of Al Shanker, former president of the American Federation of Teachers, on this. At a gathering in Saint Paul in 1991, Shanker had said that, "The one-room school was a better learning institution than the classroom we have today." Kolderie continues that, "Kids worked at their own pace. The teacher coached. Kids helped each other. But we will not go back to one-room schools…cannot hire a teacher for every six kids. Technology is the way out…to avoid tracking (in the style of Germany), to get away from teacher-talk and to individualize; to let kids work together.

The one-room schoolhouse concept—increasing personalization and attention for students—was thought by many in Shanker's time to be a pipedream. How could we possibly afford one teacher for every six or ten students? Keep in mind that the charge on America's public education in recent decades was dramatically different than that in the age of the one-room school: all students, including female, those of color, poor, and rural, now must have equal access to education and must be in a desk through age 16.

Then in 1993 came chartering. The mechanism was there. Close on the heels came a technological revolution that, we should note, is yet to be fully grasped by the ed. establishment. Modern technologies—namely the rise of the Internet and computing devices—now make it possible for students to access and process diverse sources of information, immediately, *at their own direction*. No longer is the adult teacher the all-knowing, solitary resource for students in a classroom. Libraries now have no walls, and Google makes more information more accessible. Some new project- and technology-based chartered schools do in fact look quite similar to one-room schoolhouses, with large open areas where students are connected to the Web. They have their own desks and workstations. They personalize school by working for themselves.

The implications of these very recent developments in structure and technology are significant. This essay is an attempt to outline how 21st century technologies can bring schooling back to the essence of the one-room schoolhouse, where students were their own agents of learning, the teacher was a coach, and learning personalized.

Rethinking the Student-Centered Classroom

Personalization and the Type II Application of Technology

The classification of Type I and Type II applications of technology was first coined, and developed over the course of the last two decades, by Cleborne Maddux and LaMont Johnson of the University of Nevada Reno. This article defines their conceptual work, provides context, and applies it to the pedagogical goal of bringing learning to the level of each student: what we commonly call personalization. Technology, when used correctly, can customize the process of learning for students without significantly increasing labor costs of the adult worker, the teacher.

Of Personalization and Placing Students at the Center

What does it mean for a school to be "student-centered?" Is it making students the focus of attention, or that school leaders put the interests of young people at the end of every decision? All schools claim to do this, albeit with varying success. To simply be dedicated—über dedicated—really is not enough.

For a classroom to be student-centered its learners should be in a position to help push the educating processes. They should be engaged; partners even, and have ownership over the experience. When it comes to technology this means managing devices and software such that they are tools that can be controlled for and by the student. A young person at the center of a classroom is one that is active in learning, with a degree of self-determination and choice.

The Type I/Type II Distinction

As professors at Texas Tech in the early 1980's, Maddux and Johnson paid witness to nascent computer technologies in classrooms and the public consciousness. The professors were quick to identify a disconnect between much of the industry's rhetoric about technology's role in learning, and the often dull, monotonous reality. In the early years the professors observed that rarely did teachers tap into the technology's potential. In some cases, as they wrote recently, PC's amounted to little more than digital flashcards. They saw what they considered to be a kind of "*educational reverse alchemy*, in which gold was being turned into lead" (Maddux and Johnson 2005, 2). They worried about popular backlash from high expectations and public investment, with limited results.

Around that same time the professors visited a Texas Instruments design shop that was working on new interactive software for high-resolution (16 bit) computer systems. Impressed at the engaging nature of the programs, Maddux and Johnson shifted their focus from criticizing the rhetorical disconnect to addressing instead the dichotomous ways in which technology use was emerging. They found the user of a device or piece of software to be, fundamentally, either actively or passively involved. They took this thinking on the road, developing the ideas amongst themselves, with others at conferences, and in writing. From these conversations came a classification: Type I and Type II applications of technology.

The following definitions are taken from an article authored by Maddux and Johnson in 1987, published in *The Computing Teacher* (now called Learning and Leading with Technology). Though technologies have evolved dramatically since the article was first published, the definitions remain on point (emphasis added):

> **Type I applications use computing to make traditional teaching methods easier or more efficient.** User involvement is relatively passive, and what happens on the screen is largely predetermined by the programmer.
>
> **Type II usage, on the other hand, employs computers to make available new and better ways of teaching children.** The user is the most important actor in the interaction and is the primary controller of what happens on screen (Maddux and Johnson 2005, 3).

Today the focus on computers can be broadened to include all modern technologies, as handheld devices, the scope and scale of the Internet, and the like had not been known in the late 1980's. Type I applications of technology may include drill and practice for students, and for teachers classroom administration (eg, bookkeeping). Type II applications include word processing, simulations or interactive gaming, teleconferencing and other communications, or software that encourages problem solving.

It is the way programs are *used* that qualifies their application as Type I or II. Learning Management Systems (LMS) are a Type II enabler, making the handling high technologies easier for a layperson. Webquest for one helps educators piece together web-based lessons as problem solving adventures, challenging students to think creatively and across disciplines. Teachers are using LMS' to combine their work with content purchased or borrowed from universities and for-profit corporations. There is great promise here for innovation, as individual educators are provided access and management tools to tap the resources of larger organizations.

Other examples of Type II applications include interactive games, and even an advanced "help" feature in a program can assist students to achieve more than they might on their own. In each of these cases the user is in control.

It has been said that a good rule of thumb to identify Type II programs is that many hours of use are needed before a user can begin to recognize everything the program is capable of doing. This implies there is a lot, then, that the user controls. For example a guitar player needs simply to press the red circle on an analog tape recorder to copy sounds made when he plays. This is a Type I interaction. With modern, computer-based recording software (and new forms of analog, as well) it can take years for engineers to fully understand the capabilities of their software. Great control is put into the hands of the users.

While there are many good and necessary uses for Type I applications, Maddux and Johnson have argued that only Type II offers the capacity to improve learning significantly enough to justify the public investment. With that said, it should be kept in mind that the focus here is on pedagogy, not technology. Students do not learn from technology alone. There is a concept going around on this of "authentic instruction," arguing that students' work in the classroom should

prepare them for life outside the classroom. Now more than ever this involves broader "21st century skills" such as critical thinking, problem solving, and cross-cultural understanding.

After twenty years of critical examination of technology in schools, Maddux and Johnson had emerged with tempered expectations. They wrote in 2005 that, "Computers have so much cultural momentum that they will continue to appear in schools, but they are unlikely to become part of the actual fabric of teaching and learning" (Maddux and Johnson 2005 II, 4). This is due in large part, they followed, because of a lack of instructional support that prevents busy teachers from moving forward with innovative planning.

Even so, there are educators who, despite a lack of support from preoccupied principals and overworked staff, have managed to design creative and interactive lessons that involve technology. They should be commended. But with a clear understanding of the Type II concept, and the resources and authority to experiment in pedagogical approaches, educators can capture the power of technology to personalize learning for their students *without* significantly increasing their own labor.

New Conditions and Opportunities

One cannot blame the professors for their sober analysis. Indeed, there has been under-use of high technologies in classrooms. Though despite a growing gap between the pace of technological progress in society and its usage in curriculum, the future does in fact look quite promising.

This is because two major conditions have changed since the young academics from Texas Tech first saw engaging programs based on 16 bit systems. The first is the accessibility and capacity of hardware and software. In a recent national survey, 94 percent of students in grades 3-6 reported using computers in their free time (Speak Up 2006, 8). From 2004-2005 there was a 10 percent jump among 6-12 graders in their usage of digital cameras, video cameras, laptops, and MP3 players. That was two years ago.

Young people today customize nearly all aspects of their lives, from time management to socializing and entertainment. For them everything seems to be controllable and personalized—everything, that is, but their education. Technologies today are sufficiently advanced, and students are so accustomed, that the possibility for technologies to have a meaningful impact on the personalization of learning is much more realistic than in years past.

The second condition that has changed since Maddux and Johnson first wrote about Type I and II is the emergence of alternative organizational devices for schools, namely chartering and district alternatives, which are more conducive to new pedagogical models. Termed the "open sector" by Education Evolving, this may also include branches of conventional school districts—such as Boston's Pilot Schools—granted greater levels of autonomy in curriculum and management.

Educators in the district sector may well find it extremely difficult to bring computers—let alone other devices such as iPods or PDA's—in from the periphery, *or into the fabric* as Maddux and Johnson put it. The open sector is more nimble, responsive, and attracts new sorts of innovators

from inside and out of the education establishment. Chartered schools especially have a record of entrants from professional fields beyond education, including mid-career transfers. There is a new mass of entrepreneurship coming for the first time from within.

With the ability to create new schools independent of conventional administrative and pedagogical structures, the choice options available within America's system of public education have changed fundamentally. Choice used to be within or between districts, all providing the same basic mold of service. The options have now been expanded to choice of *pedagogy*. This is good news for students and their families certainly; but also teachers.

Provided greater autonomy and the authority to innovate, educators and administrators can design models of school that upgrades teachers' work from presenting material to planning, advising, and coaching. Students in turn assume greater responsibility for their own learning, and can harness 21st century technologies to personalize schooling. Both groups of school workers—students and teachers—have greater incentive (and therefore motivation) to perform.

A Requisite Classification

The first step to making progress in the incorporation of technology is to understand that there are fundamentally different ways to use technology. Not realizing the same device—say, a computer—can be either the controller or controlled in a task, has been a key cause for the American school's failure to keep pace with the infusion of technology into wider society. The tech sector has grown exponentially in recent decades, while the understanding of its role in education has trudged along slowly. The gap between technological capabilities and their use in school is growing wider by the quarter.

The evolution of the Web industry provides a parallel. In recent years the term Web 2.0 has been put to use to describe a style of web site that is user-interactive or even user-created. On a Web 2.0 site the user is more than a visitor; he is a contributor that helps shape the content. The online, user-generated Wikipedia is an example, as is the website You-Tube where individuals upload their own videos in place of the company providing the content.

The Web 2.0 phenomenon has its origins in the battle between sites for the attention and time of web users. Public education faces much the same challenge today with keeping young people engaged and retaining them in a market of choice. The same concept of competing for attention applies to public education. Technology in schools should be seen as a competitive response, or simply an evolution keeping in tune, with the ways technology has come to be used in students' lives outside of the classroom walls.

Technology and Education in the 21st Century

Public schools have taken a peculiar position of prohibition to many of the sorts of technology that young people are now familiar with: media players, phones, mobile Internet, email. The moment a student leaves the building he is wired to technologies that are manipulated and controlled at his own direction. Outside the school walls an entirely new techno-operandi has infused itself into the lives of young people, enabling them to customize and control their

involvement with media, social networks, and personal web pages. Programs to facilitate this are increasing and accessible, including the likes of iMovie, Facebook, and GooglePages.

As technologies evolve, so to do the ways in which they can be used. A VCR used to allow for recording television. Now Tivo provides the user a capacity to actually edit entire days of programming with the ease of an efficient, on-screen, interactive menu. The hardware and software of desktop computers used to be limited to word processing and basic gaming. Now they offer an ever-expanding ability to control, format, customize, and publish information. Trouble begins when school systems and educators limit their thinking within one framework, exclusively employing Type I applications to Type II-capable technologies. When this happens the potential utility of a device is inhibited, if not hampered. As much as a building is only a physical structure, technology is empty without the proper plans for its use.

The conventional way to add something like a computer is in the compliment of existing practice: the teacher is given a laptop so he can work on material in the evenings, and students are furnished them for what amounts to note taking. The technologies that are emerging as unique to the 21st century (think smart phones or iPods) pack great potential. Yet they should only be judged as effective to the extent that they improve the educational experience. This may very well not be measured by conventional testing—or at least not at first. Assessment is important, but it needs to be inclusive of all the ways technology might enrich learning.

We will likely need to take a look at teacher training. Recent graduates from college education programs are 'digital natives,' though this does not necessarily mean they will know how to integrate modern advances into a classroom model that was designed in the 19th century. Educators operate under limitations of both structure and convention. They work in schools that allow for little input on curriculum. Teacher colleges all train toward the conventional model. Many educators know of no other way than to stand at the front of the room and "deliver knowledge." It is unorthodox to think of students facilitating learning for themselves.

The meaningful incorporation of technology to schooling is a pedagogical endeavor. Educators need to be both willing and able to design lessons that employ Type II concepts. The Learning Management Systems discussed below can help with this, making high technologies more accessible and manageable. Without a doubt, professional development will need to take on a new tone of relevance and application.

Classroom Implications: Moving Toward a Type II Education

There are emerging in the open sector what could be called "Type II classrooms." Represented currently by the likes of project-based and online schools, these represent an exciting and promising step forward for the many young people who can thrive in such environments.

Type II applications are fundamentally user-driven, which make them more conducive to classrooms that place students at the center. The hierarchies and management of traditional districts are restricting to those that want to move toward curriculum with a Type II orientation. It makes more difficult the creativity and maneuverability necessary to do the hard work of designing interactive lessons engaging of technology. Here the open sector can provide

opportunistic space, such as teacher-lead or technology-based schools. But even many charters, operating in a sector originally created in part to support innovation, tend to resemble smaller versions of their more conventional cousins down the road. They keep technology on the periphery of a model that is fundamentally adult-driven.

There are other challenges. High levels of student mobility in urban districts, an increase in the diagnosis of special needs, federal and state mandates, insufficient time to master new software, and the need to adhere to standardized methods of assessment are all barriers. And, as noted above, our teacher colleges are engrained in the conventional. But with the same national survey cited above finding that 46 percent of 12th graders say they, or someone they know, have taken an online class (Speak Up 2006, 24), the need to move is pressing.

Conclusion

These Type II applications, if applied liberally in a classroom, will be disruptive to the status quo. This may disconcert the traditional-minded. But no longer is it an option to continue only with the teacher-student delivery model that is now mismatched for an information age. Students should be let to explore what interests them, with breadth and depth. Type II applications are a medium for this process of making students the agents of their education. We might be surprised how many would move toward math and science if high school let students pursue what interests them individually and with depth.

Digital electronics have fundamentally changed all major information industries: newspapers, magazines, books, film, and video are all now accessible and interactive. Young people are consumers of these on a weekly, if not daily, basis, just as they are with their education. There is no reason why districts and other forms of public schooling should prohibit these technologies that are otherwise fundamentally changing the lives of young people. They should instead seize the opportunity to explore and apply the personalizing power of such advances. Resistance will probably only ensure that innovators that are using new technology will step in and provide that service, as some chartered and private schools already are.

Rev. TRM 1.14.08

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References

Maddux, C. D., and D. L. Johnson, eds. 2005. *Internet applications of Type II uses of technology in education*. Binghamton, NY: The Haworth Press, Inc.

Maddux, C. D., and D. L. Johnson, eds. 2005. *Classroom integration of Type II uses of technology*. Binghamton, NY: The Haworth Press, Inc.

Speak Up. 2006. *Our voices, our future: Student and teacher views on science, technology, and education*. Net Day. http://www.netday.org/speakup_2005.htm (accessed December 17, 2007).