

Technology and Education: New Wine in New Bottles

Choosing Pasts and Imagining Educational Futures

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Abstract

The shaping of a future for education depends on the choice of a past. How far one looks forward is functionally related to how far one chooses to look back. For instance, if the inclination is to view historical context as limited by the local history of a specific school, that history will constrain visions of future developments. For example, one might prognosticate about the potential evolution of governance structure, or the need to balance a specific heritage with the needs of a changed constituency and so on. Alternatively, to choose as an orienting past the American educational tradition is to find oneself reflecting on the virtues and vices of the classical canon, multicultural education, the resuscitation of science education in the interest of a failing economy, or the role of the school in addressing issues of social justice and so on. Of course, the former set of concerns related to institutional history are not incompatible with the latter related to national history. For example, the national concern with a multicultural curriculum as an alternative to the canonical curriculum might have its local reflection in the tension some institutions feel between a progressive heritage and a significant conservative constituency.

One might choose to cast one's net even more widely, however, by seeing one's school as an expression of the history of modern schools which have arguably been more the same than different since the sixteenth century regardless of national differences. Casting a vision of the future in this historical context requires the identification of the fundamental building blocks of schools qua school -- that is, the constituent elements of this institution as was shaped in modernity.

Putting aside for the moment the specifics regarding the definition of space and time, the structure of knowledge, approach to motivation and the shade of the teaching profession, it will be argued that the reason for the endurance of this hallowed institution with all its specificity is the stability of its core tool, the keystone of the system -- the printed textbook. It is further argued that the medium of print, so long as our almost exclusive means for preserving knowledge, has yielded significant ground to the remarkable storage and retrieval capacities of the computer; and that, further, this loosening of the keystone of the modern educational past allows us to glimpse, and demands that we define, a new educational future no longer constrained and shaped by the exigencies of print/textbook-based education.

The Modern School: The Past

The Structure of Time and Space

Children are grouped by age and each group has a specific space called a classroom. The groups are collected together in one larger space usually called a school building or house. The classrooms themselves are arranged to accommodate twenty to forty children so that they can simultaneously attend to one adult--the instructor. The standard unit of time is an instructional period which is long enough to accommodate a lesson. The lesson is a quantity of information pertaining to a particular realm of knowledge demarcated by the divisions imposed on that area of study by the separate units of a textbook.

Instructional periods are arranged in sequences which define the week, the month, the year.

The Structure of Knowledge and Culture

The legacy of the ancient pedagogues, the fragmentation and division of study into the disciplines of the trivium and quadrivium, was complemented by the moderns' further division of each field into the compact lessons and exercises of the teacher's most important tool -- the textbook. This standardization facilitated large group instruction and allowed for the comparative evaluation of students, essential to the school's effort to meet its responsibility for the discovery and allocation of the society's intellectual resources. Reliance on the textbook also meant reliance on the built-in educational strategies so closely joined to the information of each lesson. Because textbooks were scripted so thoroughly, it was possible for a teacher to gain significant comfort with each repetition as responses and possibilities became gradually more predictable.

The Structure of Motivation

The modern classroom provided unique motivational opportunities. Relying on the natural anxiety of the young when subjected to judgement and their equally natural propensity to measure worth through comparison, schools were able to use the common playing field of the textbook, yoked to an objectively established and highly calibrated system of evaluation, to inspire Homeric academic efforts. Public honors, social access and economic success became linked in direct ways with school achievement. In fact, in many states, the practice of justice became inexorably linked to the ostensible fairness of a system in which educational opportunity was equally shared.

The Structure of the Teaching Profession

Entering the teaching profession is most challenging in the early moments when one is unacquainted with what lies ahead. To have mastered the role of student in a school does not lead naturally to an easy execution of the role of teacher. Indeed, new teachers often experience their students as unpredictable; many wonder if they will ever be able to gain a feeling of control over "the classroom". Soon, however, after a few years of stumbling they gain a mastery of the textbooks and their associated pedagogical devices. They begin to see a repetitive pattern in the way that students tend to respond to the certain problems and issues and, most importantly, they begin to remember which of their responses were effective in which contexts. The key to their success is confinement. They must learn within the already determined environment of the textbook to focus student attention on the key issues which in linked sequence provide the essence of a stage of the mastery of a discipline. This isolation and clear pedagogical linking of the important stuff also provides the instructor with a defensible matrix of expectations against which fair evaluation can take place. Essential to the teacher, and somewhat available in the intellectual structure of the textbook, is a refined developmental sense of what is appropriate at which age level. Given the body of material a teacher must cover, time demands that repetition be eliminated and that only those things which are age appropriate, no more and no less, be the stuff of each year's work. The teacher's willingness to commit himself to being part of a team by working within the specific segment of the curricular pie for which he is responsible is a significant sign of professional maturity. To know the sequences of instruction and to know his place in them increases the degree of predictability of each day and hence adds significantly to the ease and comfort of professional life.

The Structure of Ethics in the School

The school is an elaborate social and cultural apparatus. Within its carefully defined structures are manifold opportunities for character building and the informing of the conscience with the appropriate standards of conduct of a citizen and ethical individual. With the school's broad range of daily transactions revolving around winning merit in a competitive environment governed by clear rules, students are afforded the opportunity to learn dedication to a task, self-discipline within a constraining and demanding system, and honesty and fairness within a community. The most remarkable dimension of this aspect of school life lies in its economy. For the school to function as an ethical training ground it requires only that the adults in charge be aware that each transaction or behavior of a student must be viewed from this second less overt perspective. Many teachers view this dimension of their work as so central that everything else becomes subordinate to it. The classroom becomes less a matter of instruction and inquiry and more a constant tuition in the appropriate behavior of people in groups.

The Postmodern School: New Wine in New Bottles

The question the panel will address is how each of the components of the school of the past will change with the new technology.

The Teaching Profession

Virgil's greatness as a guide and teacher for Dante rested in his understanding that his student must experience, either directly or vicariously, all the possibilities of the human soul before discussion would be of value. Accordingly, Virgil seldom offered tuition but most often responded to questions which emerged from the intense experiences of traveling the underworld. The postmodern school with its emphasis on student inquiry will introduce the element of unpredictability into daily discourse and disturb any possibility of the routinization of the educational discourse. Responding constantly to questions emerging from students' experience, teachers will re-assume the Socratic mantle and reverse the progressive de-skilling the profession has undergone since the Industrial Revolution.

Ethics

As we have depicted the ethical "conversation" in schools it focuses often on socializing the young to behaviors adults have deemed needed for a successfully functioning society. If one adds to this the additional voices which urge self-understanding, free inquiry, and often a humanist ethic staunchly opposed to the competitive forces which shape the society, then one hardly wonders at the confusion of the young who learn only the lesson that the adult world thrives on contradiction and a self-serving hypocrisy. Consider the possibility of whether the dismantling of the competitive apparatus of the school and the establishment of the faculty in the position of respondents would not also eliminate much of the contradiction in the public conversation and in turn reduce the number of voices needed to be reconciled by the students.

Time and Space

The exigency of the modern school, that tuition requires a simultaneity of time and place, will not be a restraining structure of the postmodern school. Through the use of advanced systems of electronic mail students can log queries addressed to their teachers or classmates and, then, check for their answers when they can. This exchange is of course not constrained by geography. Questions can be logged from either within the school through a network or from without via modem. The same technology facilitates scheduling live exchanges. Without the tyranny of the single focus of the textbook as the information

core of the process, one could imagine in a networked computer environment attentional foci changing as the teacher and students shift from attending to a large screen suitable for a hundred to working in small groups around workstations to individuals pursuing research on notebook computers linked to a server by a radio coupling. This requires a flexibility in the learning environment-walls which are soundproof and move, computer stations which are comfortable for four but recede when a group of the whole is formed, work surfaces which are suitable for notebooks but disappear when necessary.

Motivation

The information logistics of the curriculum, the quantity and quality available without travail, decrease or increase the capacity of the curriculum to act as a competitive game-board. In the modern school each student focuses as much on others as on the work at hand in order to catch a glimpse of where colleagues are in the race to master the same information. In the postmodern school the information resources will be expanded and the points of departure multiplied to a degree that each student will travel a path distinctly her own, albeit within the orbit of a single question/area of investigation. The learning environment will be composed of students seeking to pursue individual questions and then coming together to coordinate their results. Cooperation will follow the natural need to understand. When a students travel individual paths within a single complex and multidimensional subject area, they will, out of their own deep sense of insufficiency, seek to complement their own work with that of others.

Knowledge

The sequential textbook locks students into a journey which deems it inappropriate to either go back or forward in the sequence if it distracts them from the matters at hand dictated by this year's curriculum outline. The concept and practice of graded classes follows this division of knowledge. Imagine what would happen to graded classes if the computers contained within them a comprehensive system of information, multimedia in character and accessible to children from the fourth grade on. Try to predict what would happen or where a student would choose to go who begins with a document on the Civil Rights Movement and serendipitously explores the related hypermedia links. The notion of sequence and the sacrosanct attitude towards developmentally appropriate material would probably collapse and be revealed as the significant prejudices of the print world. Further, the modern prejudice in favor of verbalization as the preferred mode of discourse will yield to the resurgent power of visualization in the postmodern world. The former's near hegemony will diminish and a new intelligence similar to the state of knowledge in the pre-print world will emerge.