

Saying "YES" to Educational Technology: A Response to Nelsen's "NO"

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Abstract: This article began as a review of Randle Nelsen's article *Saying "No" to Computers in the Classroom*. The editor felt that the readers of this journal might benefit from some counter-arguments raised in the review. Jones argues that educational technology does not pose a threat to education but, on the contrary, could serve to free education from its dependence on classroom based instruction.

Adjusting to new technologies is not easy McLuhan offers the following quotation from another era:

“. . .this discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves. The specific which you have discovered is an aid not to memory, but only to reminiscence, and you give your disciples not truth, but only the resemblance of truth; they will be the hearers of many things and will have learned nothing.. ." (The Gutenberg Galaxy, 1962).

The invention is writing; the speaker was Plato. He was correct; with writing there was no more need to commit all knowledge to memory, Students no longer had to exercise their memories to the same extent. Something important was lost with this new technology. But few of us would argue that, on balance, writing was a bad invention.

While we can look back with some amusement at an earlier era's fear of new technologies, we can also observe that, 1) new educational technologies are often resisted in terms of what will be lost; and 2) the thing that will be lost is believed to be so essential that education itself is claimed to be threatened by the new technologies. This is essentially Nelsen's argument in *Saying "No" to Computers in the Classroom* – computers in education are depicted as part

of a larger technological threat whose outcome is the homogenization of our culture resulting in the individual's and the community's loss of freedom and control over future development. A third observation we can make from Plato's quote is that the dire predictions are only partially true. Writing did not replace our oral culture. It re-placed it while giving us more powerful tools with which to approach knowledge and learning. Computers can have a similar effect on education.

I disagree with many of Nelsen's ideas and his method of arguing them. Nelsen sets up straw men and then proceeds to attack them in the name of defending his vision of education. I will argue that neither his straw men nor his idealized educational system are real. Nelsen's straw men are the computer industry, computer-assisted instruction, and, at times, any new form of technology. The advantage of straw men is that you can define them any way you want (or better still, leave them undefined). Because they are evil, attacking them is good. For example, who would not oppose the "...bureaucratic and global corporations, as manufacturers of both computer hardware and the programmed-learning packages that accompany it, (who) continue to dehumanize and depersonalize school culture by shaping a knowledge industry built in their image."

It is true that a smaller number of corporations now dominate the hardware market compared to the early days of personal computing. Most computer users, including educators, benefit from this trend away from unique and incompatible computer systems. In any case it is not computer hardware which poses a threat to education since the hardware is meaningless without software.

So where is the threat? There was a period in the late nineteen sixties where some large corporations did look enviously at the whole education budget and sought to obtain some of this by establishing a "knowledge industry." But they quickly learned that very little of that budget was available for new technologies. I am not aware of any corporation, global or local, which has had any substantial financial or other success producing educational software, let alone materials which "dehumanize and depersonalize school culture by shaping a knowledge industry built in their image."

The reality is that the educational software industry is small and fragmented. This is partly because the amount of money spent on educational software is small compared to the amounts spent on other software (e.g., wordprocessors), on computer hardware, on other media such as textbooks, and, especially, compared to the entire educational budget. This straw man doesn't exist. If Nelsen is concerned about the threat of large corporations and homogeneity in education he should look elsewhere such as textbook publishing or school bus transportation. (Although school buses are not an educational technology per se, they are a means of bringing the student to the instruction rather than the reverse, they have a major impact on the sense of community which Nelsen feels is threatened by computers, they consume a much larger share of the educational budget than all the educational media, including

books, and they are increasingly controlled by a small number of corporations).

In preparing for his attack on computers in education, Nelsen examines other communications technologies to illustrate the "technological drift" towards cultural homogenization which threatens individual as well as community freedoms. As an example, he is critical of the commercials which interrupt televised basketball games. But this is not an attribute of television technology: it is the product of the social and economic context which has shaped television broadcasting in North America.

When Nelsen does focus on the technology itself, his arguments are only as revealing as any truism. For example, he complains that television forces the viewer to see a game from the restricted angles imposed by the camera and thereby "miss much of the play off the ball as well as, and most importantly, the gestalt of seeing both the on-ball and off-ball interaction live or together as one moment," making the TV experience qualitatively different from that of the on-site spectator. Who could disagree with this? It is an essential property of any tool that as it magnifies one capability, it simultaneously restricts others. We may as well complain that microscopes prevent biologists from viewing complex environmental interactions. The positive side of television is that it extends the viewer through space and time to see and hear the basketball game played across town or across the world at that very moment, or years ago, or in slow motion minutes ago in the case of delayed playback. Some things are lost in this process but other things are gained.

Nelsen next raises the "good old days" argument against new technologies. He complains that new technologies have changed the nature of music compared to that contained in his collection of 1950's recordings. The artist, he argues, is becoming a technologist. But, the artist has always been a technologist. Art has always been shaped to some degree by its tools, and part of the artist's talent has always been to master his/her craft as well as extend beyond the limitations it imposes. The 1950's electric guitarist on Nelsen's recordings was very different from the renaissance musician strumming a mandolin who was different from the hunter plucking a bow to make music. Each could complain, with some legitimacy, that yesterday's music was better and that their art was corrupted by the new technology. But invariably, artists are the ones who embrace new technologies so as to explore how to extend their art. It's the non-artist who most often complains about the loss, who argues that photography and film are not "real" art like painting and drama. Are we being set up for the argument that computer-based learning is not as real as book-based learning which, in turn, is inferior to memorising your elder's stories?

After examining the threats in other technologies, Nelsen turns to the use of computers in education. He presents the "drill and test" mode of CAI against a backdrop of an educational system characterized by . . . the interconnections among *collaboration in, demonstration of, and the freedom one has in controlling* her/his own learning." I agree that drill and practice software is sometimes objectionable and that too many computer-based learning packages fall into this category. But drill and practice is only one form that computer-based

learning may take. Dismissing computers in education on this basis is like dismissing all books because some school books are spellers and workbooks.

Drill and practice as a mode of instruction pre-dates computers. Many of us learned to spell, multiply and type efficiently this way. Musicians still spend hours practicing scales so as to achieve the level of craftsmanship needed to express their artistry. The point is that drill and practice has a place in education and in the educational use of computers. It would be just as wrong to make it the predominant mode of instruction as it would be to eliminate it altogether.

Nelsen's describes computer-assisted instruction as "production-line schooling," "bits and pieces learning," "fragmented, isolating and tightly controlled learning which treats human beings like pigeons pecking at keys." I don't know what Nelsen has seen, but I have seen very little of this type of computer-assisted instruction. If anything, CAI is more noted by its absence than its presence in schools. The reason for this is no longer the lack of computer hardware or software. The number of computers in North American schools is impressive. The amount and quality of software still leaves a lot to be desired. But visit any school and you would be hardpressed to find the mechanistic learning systems described by Nelsen. As an educational technologist I am both encouraged and disheartened by this. I am glad that we do not see the world described by Nelsen (because it simply does not exist except as another straw man). On the other hand I am saddened to see that educational technologies are not better understood and adopted for the positive learning experiences they could provide.

Nelsen is correct in his observation that the "personal computer revolution" is not "actually creating a revolution in the sense that large-scale socio-economic arrangements are being fundamentally altered." This is particularly true in the case of education. Maybe we are too easily influenced by media hype which is ready to label any novelty as a "revolution" (have all the kitchen-aid revolutions fundamentally altered the socio-economic arrangements between men and women in North America?).

Maybe education is more resistant to change than other sectors of our society. Or maybe our perceptions and expectations of both education and technology are unrealistic as evidenced in Nelsen's criticism of computers and romanticization of what actually takes place in a classroom, with or without computers: "the computer is becoming just another means for further ritualizing and mechanizing a top-down direction which further abridges what little freedom is left both students and teachers together to discover and satisfy their unique desires by developing their own styles of learning." Or further, "it is precisely this failure to create a social world, a world where each individual knows that s/he as a person exists as part of a larger collectivity and is developing a meaningful voice in engaged interaction with others, which troubles me most about the widespread reliance on computers within and outside the classroom."

While it may be pleasing to romanticize schooling in a pre-computer, pre-

television age, the reality is that the computer and television and most other technologies including print have had little fundamental effect on education. Another reality is that schooling rarely resembles Nelsen's ideal (a fact which he admits). I would like to argue that this is because one communication medium, the unamplified spoken word, continues to dominate school-based education. This medium has shaped the physical and institutional nature of schooling in such a manner that it is impossible to introduce other media without adapting them to the point that they lose their unique characteristics. They become aids in support of the dominant medium rather than independent resources in their own right. When Nelsen says that computers should not have a place in the classroom, it may very well be that the "class room" is the wrong place for a technology which is not limited by class or room (or time for that matter).

Let's examine some of the characteristics of voice communication as the dominant educational medium to determine how it has shaped schooling. Unamplified voice communication is characterized by its limited range, susceptibility to noise interference, and time-boundness. Because the spoken word is ephemeral, that is, it disappears as soon as it is spoken, the sender and receiver must be spatially and temporally proximate. Because it is susceptible to outside interference, the sender and receiver must be isolated from noise and visual distractions. This isolation can be provided by physical barriers such as walls and by social barriers such as the rules which define acceptable classroom behaviour.

An educational system designed around this medium takes on certain characteristics. Schooling consists primarily of one person in a position of authority speaking to approximately thirty other people, controlling the nature and amount of speaking among them. So as to further facilitate communication between the one and the many, homogeneity of group membership is imposed based on criteria such as subject matter, age, gender, and previous success in adapting to this environment (i.e., "passing"). If Nelsen is disturbed by the "rule-drivenness" of computers, much more could be said about the schizophrenic "rule-drivenness" of schooling where chewing gum, talking to a neighbour, daydreaming, reading an unprescribed book, standing or walking without permission are such severe transgressions that the student committing them is either punished by being subjected to more schooling (detention) or removed from schooling (suspension). Many of these rules can be traced back to the need to control the conditions which affect voice communications.

Far from endangering education, computers and other technologies could instead liberate education by de-schooling it, by providing alternate communication channels. Whether this happens is not simply a technological question Nelsen is correct in pointing to the larger social context within which technologies are developed, adopted and adapted by institutions to support and enhance their current agendas. Education has resisted the "technological drift" that Nelsen warns about, not because it has some duty to preserve an older culture, but because it has institutionalized one medium, teacher-led

verbal instruction, so deeply that classroom instruction has become synonymous with schooling which in turn has become synonymous with education. If we wish to see fundamental changes in education, both of the liberalizing kind sought by Nelsen and of the empowering kind that technology can provide, we will have to start by analyzing what what is meant by media, instruction, schooling and education in the hope of generating new relationships among these concepts.

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