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Training for information technology use in traditional and futuristic schools

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Abstract

This paper explores the role of technology in changing society and in changing our schools. It proposes that recent educational changes have been implemented as a response to technology, not as a response to our interpretation of what we believe is important to human beings. The paper carries out a critical analysis of schools in the past and in the present.

Keywords

Culture, curriculum policies, implications, information technology, social issues

In 1849, Dickens wrote a book called "Hard Times". In it he describes the following classroom situation between teacher and student:

"Give me your definition of a horse."

(Sissy Jupe thrown into the greatest alarm by this demand.)

"Girl number twenty unable to define a horse!" said Mr. Gradgrind, for the general behoof of all the little pitchers. "Girl number twenty possessed of no facts, in reference to one of the commonest of animals! Some boy's definition of a horse. Bitter, yours."

"Quadruped. Graminivorous. Forty teeth, namely twenty-four grinders, four eye-teeth, and twelve incisive. Sheds coat in the spring; in marshy countries, sheds hoofs, too. Hoofs hard but requiring to be shod with iron. Age known by marks in mouth."

"Now girl number twenty," said Mr. Gradgrind. "You know what a horse is."

She curtsied again, and would have blushed deeper, if she could have blushed deeper than she had blushed all this time.

Here we see that in the extremely traditional classroom, there is only one right answer to a question. The teacher controls the environment, plays one child against another - humiliating the girl. Later in the same lesson, he humiliates the girl because she says she fancies flowers. The teacher retorts that she must never fancy.

"Fact, fact, fact! ... You are to be in all things regulated and governed by fact. We hope to have, before long, a board of fact, composed of commissioners of fact, who will force the people to be a people of fact, and of nothing but fact. You must discard the word Fancy altogether. You have nothing to do with it" (Dickens, 1965).

The above classroom is an extreme and in fact a satirical portrayal of education in the 19th century. What then is our usual image of the traditional classroom? In a teaching model for traditional education, Frase (1972) describes traditional education as having rigid classroom organisation, knowledge transmitted through passive memorisation, the teacher a disciplinarian and dispenser of knowledge, while the student becomes a passive consumer of knowledge. Evaluation is important and is carried out by the teacher through objective tests.

The following paragraph will describe River Oaks school, a technologically advanced school in Ontario:

By Grade 6, students with keyboarding skills were writing 3,000 word stories and were impressive in their ability to organise these very long tales. Finally, their ability to access information through the Internet or on CD-ROMs - atlases, encyclopaedias, image banks, "conversations" with peers in Japan - allowed them to create richer works. "Interestingly," Ownston says, "while the quality goes up, so do the students' expectations" (Report of the Royal Commission on Learning, 1994).

It is the basic thesis of this paper that deep technological changes in society are in turn affecting schools and their ability to adapt to society's needs.

According to Hargreaves:

The collapse of singular political ideologies, the diminishing credibility of traditional knowledge bases, and the declining certainty attached to scientific expertise have far-reaching ramifications for the changing world of education and the place of teachers' work within it (Hargreaves, 1994).

As is clear, knowledge is no longer a static body of information, which one can acquire through a formal teacher training process. Nor is access to knowledge any longer the domain of teachers alone. The youngest of children in our society have access to programs like Sesame Street that introduce the world of literature, history and geography to toddlers playing on the floor in their living rooms.

Furthermore, with cultures of the world coming together traditional cultural, religious and ethical social structures are increasingly called into question. Further, because of the increasing pace of technology, and the very huge demands of the workplace on the family and the community at large, traditional societies no longer exist.

As the Report on the Learning Commission (1994) states:

The old communities - family, village, parish, and so on - have all but disappeared in the knowledge society.But who, then, does the community tasks? Two hundred years ago whatever social tasks were being done were done in all societies by a local community. Very few if any of these tasks are being done today by the old communities anymore. Nor would they be capable of doing them, considering that they no longer have control of their members or even a firm hold over them. People no longer stay where they were born either in terms of geography or in terms of official position and status. By definition, a knowledge society is a society of mobility.

Thus we see that technology has taken over our society and that it has deeply affected our schools. While in Dickens' schools, students were relatively homogenous in terms of ethnic, linguistic and cultural background, they would also be grouped according to socio-economic background with almost no movement upward. If the teacher was king/queen over his/her classroom, his/her domain was made possible only by the fact that it was possible through teacher training to acquire and retain a large proportion of the knowledge available at the time. Changes in knowledge were relatively rare and were slow over time. The teacher could afford to be a strict disciplinarian because the society outside the school was rigid and hierarchical. Students were used to being disciplined by their parents - and their parents were used to being regimented in the hierarchy of the society in which they lived.

In today's school, the teacher is no longer 'expert' but facilitator, the student is no longer an empty vessel but an active participant, the skills the student has to learn are no longer memorisation but "learning to learn". The society around the student has changed so much that the student is no longer assured of his/her place in it through a pre-arranged hierarchy.

Students must participate in their government through democratic responsibility. Whereas in Dickens' day one followed the current of the river of life in one's day to day living, today one has to exercise choice in everything one does - choice of dress, choice of place to live, to work, to marry or not, to have children, etc.

The authors of this paper agree that the content of the curriculum must change to reflect changes in the social make-up of its citizens, changes in our knowledge base and changes in our approach to learning. However when it is proposed by educationalists that we no longer need content, that we no longer need courses of study - that choice of content, curriculum and courses of study are subjective and need to be left to individual teachers, then we part company with expert opinion.

We believe that embedded in traditional content, embedded in traditional subject areas are thousands of years of human knowledge, skills and a discipline that we would be foolish to throw out for new forms of knowledge that we will continue to change as fashion demands.

This is not to state that the authors do not believe that students cannot be critical thinkers, independent inquirers and able to search out knowledge on their own, but rather that those abilities are embedded within traditional subjects.

The authors also argue that while technology is changing society, the skills we need to acquire are not just the skills of technology. We need also to have a deep and clear understanding of what it means to be human beings both in an historical but also a futuristic sense.

Technology is very much part of our lives and we cannot afford to ignore it. But the point that this paper wants to make is that while technology is part of the air we breathe, it may not be the solution to our problems in society. In the next section, we shall give a description of how most Western democracies have approached educational change in the past few years, and we shall demonstrate that these changes have all stemmed from technology - either technology as a problem or technology as a solution.

This paper will show that learning goes beyond technology, that the traditions of learning have existed with us for thousands of years, and in ignoring these traditions we may well be throwing out very valuable tools.

In an article on the Common Curriculum, the newly implemented integrated and outcomes-based curriculum in Ontario, Jean Hewitt states that in many countries around the world new curricula are emerging which have a number of common features. They are: broad "essential" cross-curricular learning, specific learning expectations as targets or developmental markings to be arrived at by pre-determined grades, abandonment of the subject or topic focus found in traditional curriculum documents in favour of measurable and observable statements of achievement which includes more generic knowledge, skills and values and a number of new "basics" such as technological literacy and the ability to work collaboratively while both restating and broadening the traditional basics of literacy and numeracy (Hewitt, 1995).

In the above description we see that subjects and topics are abandoned in favour of cross-curricular, generic knowledge and skills. Literacy and numeracy are expanded with new basics such as technology and working collaboratively.

We would like to start off by critiquing the notion that technology and working collaboratively are the same "literacies" as literacy and numeracy. Both literacy and numeracy were traditionally very content-based - with, in the case of literacy, students having to acquire knowledge of a huge canon of cultural knowledge. One can argue that this canon was elitist and did not reflect all members of the society which it pretended to represent - but one cannot react to this by abandoning all specified content which this curriculum is proposing to do.

In terms of numeracy, there is specific content that has taken humanity thousands of years to achieve. It is true that with the arrival of the computer much of the mundane arithmetic that took up our time has been relieved - nevertheless the process of acquiring these skills through specific content gives students a discipline and an appreciation for hard work that we believe is vital to their success in any field.

However, to be fair, that in the case of numeracy or mathematics, equating skills with content will not do the field of mathematics as much harm as in the case of literature, history and geography, - subjects that have actually been abandoned in the new curriculum. The study of literature is given a paragraph and is placed alongside the study of media texts which are defined as printed, visual or oral materials transmitted through a variety of mass communication media (for example, newspapers, films, radio and television programs, CD-ROMs).

Here we see an explicit example of the form of the technology taking over the content - as any adult who had undergone a traditional form of education will realise, the skills associated with becoming knowledgeable and analytical in each of these areas are quite different - one from the other. There is a different discipline, a different skill - a different analytical stance that one must adopt when critically evaluating literature, hypermedia or even a movie.

For example, it is our belief that through acquiring a deep knowledge of literature - through understanding what theme, plot and character development are, we may transfer this understanding to any part of our lives including our reaction to movies.

However, pursuing literature on the World Wide Web may require different skills - students will have to understand the nature of the logic or illogic of hypertext - the web-like nature of making connections - and these have little to do with the genre of the novel, which in and of itself represented a view of society and the novel at the time that it was first conceived.

We believe that underlying all content in the traditional subject areas, there were keys to understanding world views, to understanding and analysing social and cultural heritages - heritages and disciplines which we stand to lose if we simply allow teachers from year to year to make their own decisions about content.

As Emberley and Newell state:

Many classical allegories for liberal education - for example, the voyages of Odysseus or Telemachus - represent a journey of the soul from one's particular time, place, and attachments to the universal and back again to one's own. The same cycle of transcendence and return is sketched by Plato in his *Image of the Cave*. In our experience as teachers, we find that young people are still naturally inclined to fall in love with this journey to the stars and back.... This journey to the great ideas liberates us from the unthinking conventions and orthodoxies of the day, but only so that we can return to our own way of life better able to appreciate both its defects and its virtues (1994, p. 11).

In fact in the first author's thesis work, she studied two teachers - both teaching side by side, at the same grade level in the same school - but with vastly varying results in the performance of students (Kassam, 1993). In this case, one class was very content based and the other emphasised student creativity and student-centred learning with very little teacher direction.

In observations in these two classes, it was also discovered that those students that came from privileged backgrounds did far better in situations that were child-centred than did students who came from problem family situations. In these cases, students benefited much more from structured environments with specified outcomes and pre-specified content. One can argue that the Common Curriculum comes with outcomes and is not as free as child-centred education to which it came as a reaction - but it is our belief that outcomes and skills are simply not generic - they must be embedded in content to be truly appreciated by students.

As Wallach states:

What needs to be learned is close to the textures of particular fields of work, not removed from them in some abstract realm...Disciplines like the learning of a musical instrument, the craft of poetry writing, or the command over one's body involved in dance all primarily seem to involve matters that are field specific. There are huge conquests of technique that must take place in any of these domains, together with the cultivation of knowledge about styles and forms that lets a person come to understand and hear the difference between a more and a less sensitive rendering of say, a Mozart piano sonata.

Thus we see that in acquiring the cultural knowledge of our society, we need more than just generic outcomes - we need to be placed closely to the content of each of these cultural disciplines. This content can be changed as our knowledge base changes - and with the access to the Internet, this becomes infinitely easier than the publication of textbooks every 10 years. According to Bailin :

(The nature and structure of disciplines) do not consist in static, fixed bodies of information and techniques. Rather, they are traditions of knowledge and inquiry which are alive and open ended. They consist not merely in information but also in questions and in procedures for investigating these questions. And even the bodies of facts are not fixed but in flux, as are some aspects of the inquiry procedures.

And as classroom observations show, teachers when faced with no content react in different ways. Some teachers plan a program and a course of study - others simply arrive with different materials each day, attempting to teach skills defined in the curriculum guideline in an ad hoc fashion. It is our belief that a student who has undergone a traditional education with a strong content base - regardless of whether the content is up-to-date or not - acquires a much stronger analytical, critical and independent work discipline than one presented with varying materials and media from one day to another, one year to another.

However, the authors of this paper do not disagree with all changes proposed in recent years. The reforms of the Common Curriculum, where the student becomes the centre of learning, where knowledge is adapted to suit all student needs and interests, where the student is taught to be independent and critical of resources, are all positive as compared to the days of Dickens, where the horse had only one definition and that was the teacher's.

We have tried to show however, that while technology has placed much more content in the hands of students and teachers, the skills of the discipline - no matter which subject area - are slowly being eroded. We have argued that this has been both a cause and a reaction to technology - technology has provided human beings with infinitely more resources of content, but we have reacted by using the technology to analyse, relate to and deal with these resources. We have argued that analytical discourse and world view come independent of technology and we do not require technology to teach these disciplines to our students.

We have argued in this paper that while the traditional classroom is clearly not the education we need today, the classroom of the future would do well not to discard all content. The inclusion of the content provided by liberal education, albeit with acknowledgement of the cultural diversity of today's democracies and a judicious use of technology is a better alternative than providing generic skills with no clear guidelines for content.

In planning teacher training for technology, let us make of our pre-service students, intelligent but critical users of technology not its blind followers mesmerised by its potential. We shall end with a quotation:

The showy and faddish gestures of educational radicals towards global competitiveness and redressing inequity are, we argue, no substitute for the freedom of the mind and the balanced political judgement aimed at in a liberal education. This is an education which is without ostentation, an education which through gradual and sequential formation of habits and talents produces a critical and impartial mind.