Education 2000

A Report on Three Conferences: October 26th - November 5th 1991

'Changing the School Curriculum'
Soest: Germany October 25th-29th, sponsored by IMTEC (Norway), NOVO (The Netherlands) and LSW (Germany)

'Learning for All; Bridging Domestic and International Education'
Alexandria, Virginia October 29th - November 1st, sponsored by the "United States Coalition for Education for All"

A public lecture I gave at the University of Indiana on 'School Re-structuring: A U.K. Experience' while visiting the Key School, Indiana.

The Conference in Germany was attended by some 50 people from Germany, The Netherlands, Denmark, Norway, Sweden, Belgium and the United States. The Conference in Alexandria had over 300 delegates roughly two thirds being either policy makers, providers or researchers from the United States, and the remainder being from various agencies worldwide; key note speakers included David Kears - the Deputy Secretary for Education (and former C.E.O. of the Xerox Corporation) - the Minister of Education for Korea, the Deputy Minister from Russia, Al Shanker, Howard Gardner from Harvard, and key World Bank and Unesco figures. I was the only person from the UK at either Conference.

This report attempts to summarise issues out of these conferences, from the perspective of Education 2000. Immediately it is intended for the Management Committee; if necessary it may later be amended for a larger audience. Particular thanks are due to British Airways for their provision of transatlantic air tickets.

Both conferences focused on the difficulty of implementing school reforms, and the frustrations that, despite enormous energies, not much seemed so far to have changed.

The European conference stressed the need for an overall 'cultural change' if it were to be possible for young people to take responsibility for their own learning. There was deep concern that reform so far had been piecemeal... and now it needed to be systemic. Reform has been driven by educationalists and now needs far more of a community approach. Across the countries concerned at a time when interest in education had increased dramatically (a) there was actually a reduction in available funds for innovation, (b) education had passed within a decade from stability to high levels of turbulence and (c) there were strong moves towards decentralisation of provision and delivery.

My paper emphasised our work on 'whole systems change'; it was widely applauded, though the Germans, I think, found it hard to see how the community could take responsibility from the bureaucrats. 'I'm gobstumped!' said a most intelligent German woman, "It's a fantastic concept but could we Germans eventually actually do it?". An American quoted a recent comment from Lamar Alexander, the United States Education Secretary

"We've got to transform the way our schools are organised and what they are doing, what they are teaching, how teachers are trained, what schools look like and how they are staffed. We have got to try and transform the schools and the way we do things outside the schools."
The American conference, too, was much concerned at the apparent failure of existing reform; the recent release of the annual "Test Scores" showed remarkably little improvement despite the increased drive in recent years "to teach to the test". A deeper concern, expressed by various speakers in different ways, was the ever deepening conviction that "teaching to the test" was, in itself, destructive of the development of so many of the skills the conference was calling for - the ability to reason, to draw conclusions, to synthesise, to make decisions and to develop transferable skills for use in changed circumstances. Frequent reference was made to the inappropriateness of the "industrial model" of school to the creation of higher order skills, and much talk of the need to find a new model of learning that would take advantage of new understandings of the brain's capacity to learn.

There was much interest in my paper which, drawing on Education 2000 experience, talked about the need to redesign schools by looking specifically at how pedagogic change within formal schooling (linked to research on how learning takes place) could be linked to informal, non-institutional learning in the community, and draw upon the potential of information and communication technologies to create a new model for learning centred around the concept of empowering the young person to manage their own learning as a lifelong activity. This idea was taken up publicly by several subsequent speakers.

A key part of the conference focused on the way extensive research of recent years which is now able to draw significant conclusions into the operations of the brain and its ability to learn. Let me try to simplify what I understood various speakers to be saying (particularly Gardner, Caine, Cash and Roberts): these drew as much on the work of neurologists, as psychologists.

Research on the relationship of the brain to learning shows two distinct brain processes at work.

(i) Evolved over aeons of time is the Taxon Memory which builds up very specific "sets" of instructions, originally to enable man to take evasive action to threat; essentially a set of very specific instructions which had to be learned parrot fashion. Our culture has capitalised on Taxon Memory (which we now know to be only one sixth of the brain) to extend our "memory bank" - simple examples would be the memorisation of telephone numbers, spellings and chemical formulae. Taxon Memory is highly prescriptive and operates in an almost "content free" environment - i.e. each piece of new memory stands on its own, it is not related to previous things memorised. It is this area of the brain which educators have traditionally sought to develop. The learning of a foreign language, in a classroom with no exposure to 'French as spoken by the French' requires an expansion of Taxon Memory; it is learning not directly related to earlier knowledge. It is the predominant outcome of conventional education; it can be "measured", we can "swot up" the facts, and get a grade... and then, subsequent research and practical experience shows, we progressively lose such information with time unless we exercise this continuously.

(ii) There is an innate learning system - known as Locale Memory - which is deeply embedded in everyone, and which handles enormous quantities of data continuously relating this to pre-formed, but evolving, patterns. It is largely subconscious; it is driven by creativity and novelty and helps the brain "to make sense" of a range of stimuli. Examples include the young child's ability to "learn" his native language; an adolescent's ability to handle football scores, and an adult's ability to recall with amazing clarity almost incidental details of the previous day, or from years gone by. Locale Memory is thought to represent five sixths of the brain's potential.
A useful metaphor was given. On coming into a new city, and needing to get to a
destination in another part of the town, you can do one of two things.

(a) You can get either specific directions... 'first left, second right, bear left at
the Y junction by the Church, etc.' or

(b) You can buy a map and work it out for yourself.

The former method may well be the quicker; but if a mistake is made you are literally
"lost". If you remain in that town for a while you may "learn the route" and may learn other
routes as well; some people if sufficiently motivated can quickly transfer the combination
of route directions (Taxon Memory) into a good mental map of the town by exploring to
find alternative routes (Locale Memory). They do this out of inquisitiveness and a deep
seated desire "to make sense" of the geography of the town. Later on, going into another
town, the person who has not bothered to "explore" - to develop a feel for the land - is at a
distinct disadvantage to the person who has learnt how to "make sense" of stimuli and
quickly takes advantage of the new circumstances. This is, of course, both a metaphor and a
real example; in this way the brain forms "mental maps" for all kinds of situations.

Taxon Memory is very important (i.e. Multiplication tables) but it is insufficient for
complex issues. There is not an automatic link between Taxon Memory and Locale
Memory. This is the big issue for educationalists. Simplistically it depends on a conscious
decision to take a set of "content free" instructions and try to place them in the Locale
Memory in a way which they "make sense" to pre-existing patterns, so that the new
information is assimilated at multiple levels. (The very young child does this
subconsciously when learning his native language; the older child in the classroom has not
that advantage.) Successful "transfer" is characterised by people working in "High
Challenge, Low Threat" environments.

Research is also showing that there are three tiers for learning -

Surface Knowledge which comprises information and procedures which
are held in the Taxon Memory.

'Felt' Meaning where this is first transferred into the Locale
system leading to a sudden appreciation that 'this
fits', 'it makes sense', 'ah-ha I understand'.

Deep Meaning when a new set of ideas is so well assimilated into
the Locale system that it becomes real
understanding and can't be lost.

The progression from surface knowledge which is inert and does not change perceptions to
real deep understanding is now the matter of intense research. One thing is, however,
already very clear; the human being, presumably developed again over ages of hard
experience, is a more powerful determinant in this transfer process than any
external incentive. I.e. You can "take a horse to water but you can't make it drink"
(unless it wants to itself - use of the Locale Memory).

Intrinsic motivation (I'm in charge of my own destiny, I want to do this, its fun) is far more
significant than extrinsic motivation (learn this and you will pass your exams and I will give
you a present). The corollary of this, which is now coming through very clearly in the
research is that an excessive use of extrinsic motivation sets up very real internal
barriers to transfer, and that while someone will "learn for the test" they will do this
almost entirely on the Taxon system keeping, as it were, the Locale system
undefiled. There was considerable discussion about the implications of this for people
with good degrees who seem unable to do anything other than act as a total novice in other
areas not that far removed from their own "specialisms".
This led on to a matter of particular concern, namely the emergence of "down shifting". When under pressure, emotionally unhappy or disorientated, even quite knowledgeable people have a tendency to "down shift" into Taxon mode and to react simplistically, bluntly and without the sophistication to which they normally have access. The less used people are to working with deep meaning, the more likely they are to revert to knee jerk reactions when under even slight pressure.

So, and I am aware that all the above is at a high level of generality, what does this mean for learning and particularly for Education 2000? Four interesting quotes were given at the conference:

"Our schools... are not ineffective because they do not know what happens at synapses or the chemistry of neurotransmitters, but rather because they have yet to address the brain as the organ for learning, and to fit instruction and environment to the "shape" of the brain as it is now increasingly well understood. We know that as the consequence of long evolution, the brain has modes of operation that are natural, effortless, effective in utilising the tremendous power of this amazing instrument. Coerced to operate in other ways, it functions as a rule reluctantly, slowly, and with abundant error."

"Two stone cutters... were engaged in similar activity. Asked what they were doing, one answered, 'I am squaring up this block of stone'. The other replied, 'I am building a cathedral'. The first may have been underemployed; the second was not. Clearly what counts is not so much what work a person does, but what he perceives he is doing it for."

"I taught them, but they did not learn"

"Education and the process of educating is a total integral, contextual situation which includes students, teachers, parents, administration and environment."

Education 2000's starting point is our emphasis on the importance of empowerment to individuals to take responsibility for their own learning; this is entirely consistent with the ideas being developed in cognitive Science. The ability to learn is a natural reflex - after sex and survival it is the individual's ability to use the skills of learning to transform from a problem in one environment (pattern) to an opportunity in another, because he has found a new way of "making sense" of the information in an expanded framework circumstances.

Brain-based learning involves acknowledging the brain rules for meaningful learning, and the organisation of teaching with these rules in mind.

- The learner has to be actively involved to develop deep understanding, and has to be personally motivated to ensure that this builds on existing schemata.

- Learning proceeds most successfully in highly challenging but low threat environments.

- Learning and self-esteem are intrinsically inter-connected, and vice versa.

- Ideas based on 'Behaviourism' are far too restricting; an over use of extrinsic rewards (to pass the test you will get a prize) can actually work against the development of any true level of understanding.
A Mechanistic approach is not appropriate; it does not lead to creativity. 'Humans are more than machines.' Human capacity looks very different if we consider it from the perspective of biology, rather than engineering, if we regard the brain as something living, and growing (which it is) rather than to a machine (which it is not).'

Education cannot stay in the memorisation business. Teachers fail (as do others) if they see their role as "putting information into children".

The structure of the brain changes as a result of experience; its shape is not preset. Winston Churchill once said "We shape our houses, as they shape us".

The environment, and emotions, affect the brain physiologically. "If, beginning tomorrow, we did nothing more than protect children from the destructive experiences closely linked to some form of abandonment, we would have built an emotionally healthier, brighter generation twenty years on from now."

Precisely what is this suggesting? At this stage there are many ideas but none fully worked through. One school in Indianapolis - the Key School - has been working with one of the proponents of these ideas - Howard Gardner - for the last six years. It is held in hard regard by people of authority across the States. But the school itself knows how little it has so far been able to achieve and, locally, its very existence is at stake for reasons not dissimilar to those well understood by Education 2000. Most people, and most schools, it would seem, are only tinkering as yet. It led to the lovely statement "If you want to leap across a chasm you will never do it with two small jumps".

Howard Gardner, from Harvard, who proposed the concept of Multiple Intelligences in the mid 1980's which has been most influential in moving away from a behavioural concept of intelligence as a fixed controlling factor, is encouraging the concept of the "cognitive apprenticeship".

On hearing this I had to do a double take. It was earlier this year that I first almost apologetically and certainly hesitantly, spoke of Britain reaching the zenith of its industrial power thirty years before the introduction of compulsory schooling mainly on the back, quite literally, of apprenticeship leaning.

The best description of cognitive apprenticeship is that from Resnick (Pittsburgh) "First, learning is a process of knowledge construction, not of knowledge recording or absorption. Second, learning is knowledge dependent; people use current knowledge to construct new knowledge. Third, learning is highly tuned to the situation in which it takes place". This tallies most directly with work from the IRL in Palo Alto.

Gardner also emphasises experiential learning (of which the British have some valid experience through TVE1) citing the new concept of children's museums namely EUREKA in Helsinki, Launch Pad in London and the Exploratorium in San Francisco. "No-one ever flunked the Exploratorium", exclaimed its proud originator!

Needing to produce this summary shortly after the conference I know that I have still much work to do in reading 3 books which underpin the presentations made at the Alexandria conference. Once this is done I have no doubt that I shall wish to revise this note. They are

Howard Gardner "The Unschooled Mind : How Children Think and How Schools Should Teach"

Renate Caine "Making Connections : Teaching and the Human Brain"
both of which were published within the last few weeks, and

The U.S. Office of Congress "Linking for Learning".
To professional educators, and those interested in cognitive science, these were familiar ideas. To have them presented in such a conference and, as it happens for this to come just after my paper, elevated subsequent on what "whole system" change might release. As exciting as this was however I could not refrain from an outburst of frustration, which I made public, that having just come from a conference in Germany where these very issues were being discussed apparently in total isolation of the discussions in America we were missing a prime opportunity to move this whole issue further much faster... if only we could/would look to other areas for collaboration.

A Footnote

Midway through the conference I was invited at short notice to a meeting at the United States Chamber of Commerce in Washington to meet the Deputy President for Domestic Policy. At a totally informal level he wanted to talk about the Education 2000 concept because, with the imminent cutback in defence spending there is an opportunity, now being discussed with the highly influential DARPA - the Defence Applied Research Projects Agency - for a possible diversion through a partnership with the Army for a massive investment in distributed electronic learning systems (on a quite "mega" scale).

Tentatively I thought it right to push the need to have a philosophic side of the concept right first only to find that he was as well versed in these ideas as I was. Yet again I was left wondering if the Americans, despite all the problems they have got to overcome could not suddenly jump forward and totally overtake the speed at which we are proceeding.

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