

Minimally invasive education

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Physicist Sugata Mitra's research on 'Minimally Invasive Education' for mass computer literacy and the 'hole in the wall' (www.niitholeinthewall.com) experiment in India immediately struck a cord in me. I noted with interest the similarities between his findings in India in which he concluded that children learn to operate as well as play with a computer with minimum intervention, picking up skills and tasks by constructing their own learning environment, and my own practical experiences in secondary schools here in the UK as this methodology has been used for several years now in ICT (Information Communication Technology).

As the Head of an ICT department in an inner city secondary school in the northern industrial city of Sheffield, I have noted the performance of very varied ability pupils. The ICT department has mixed ability groups, leaving the teacher with learning objectives and lesson planning that have to fulfil the requirements of all the pupils. It is a well-known fact within ICT that the ability to read and write to a set standard does not inhibit ICT learning. In fact pupils with lower than average reading and writing skills have at times excelled in ICT. It appears that the 'hands on' approach to computers not only stimulates the pupil but also allows the pupil to exceed their own perceived limits. When this is recognised by the pupil the 'war' is won. Many pupils who are reluctant learners in most subjects become enthusiastic learners in the ICT rooms. For the lower ability learners ICT allows them to equal those around them, break down the cans and can-nots and in many situations reverse them completely. There have been many instances where friendships have grown between pupils of different abilities, race and religion where bullying once occurred. With no animosity between pupils, they share information regularly, showing each other a new

technique to achieve an end, it also seems very evident that there is a strong bond between all the students regarding ICT as when one student discovers something new or interesting to do on the computers, within days the whole school knows and is doing the same.

The mix of abilities in the grouping generally leads to one pupil finishing before the others and then going round the class helping or 'scaffolding' the others to catch up. When I observed the interaction I was interested to note the pupil subtly demonstrating collective learning. They appear to gain a great deal of respect from this ability amongst their peers, which encourages the pupil to continue to excel in the subject.

I have, on numerous occasions, witnessed Mitra's hypothesis where it is suggested that unsupervised use of computers can lead to accelerated learning of skills in children. I have, for example, attempted to prevent unauthorised Internet access in my department by removing the Internet explorer icon from the student's computer desktop. This was combated and bypassed successfully by the students within three hours. They achieved this by simply going to Microsoft Word and using the online search facility for clipart. From there they could go online without any problem. Another fine example of collaborative learning became evident when the command prompt icon was accidentally restored to the students computer desktop. Within three days the students were using DOS (the disk operating system) to send messages to each other during lessons, hidden within the network. Upon investigating this, I discovered that the students had simply played around with the system until they had learned how to do it. This is rather startling as this is degree level networking which fourteen year olds had learned in three days just to send the

<http://plymouth.k12.ct.us>



Children explore computers at a primary school in England

equivalent of text messages to each other. What was also of interest was the fact that even though the students had effectively 'hacked' into the school system, no damage was done.

With regard to Mitra's findings on the comparison between the learning abilities of the first and second experiment, among different sectors of society, I have noted that many pupils that come to school with the benefit of a computer at home often shine in the short term only to effectively rely more heavily on teacher interaction as the years go by. Simply owning a machine at home is not a prerequisite to learning. The pupils I receive at my school come from a disadvantaged area of the city, the majority of which do not have access to ICT outside school. When they arrive at 11 years of age it is easy to see the pupils who have unlimited access over the others, as they are over confident in their abilities, relying heavily on their familiarisation with the machine. Although these pupils are very experienced using the computer to play games or surf the Internet, little or no knowledge on the practical uses of a computer are evident. This means that the pupils with a machine at home only see a machine as a superior toy, whereas the pupils with no contact see the computer as a tool to be experimented with and adapted to meet their needs.

As a result of this, the pupils with no access outside school adapt the machine using all its facilities and learn much quicker. They are more likely to press buttons and try everything, they find right mouse buttons faster, they remember actions or combination of actions better, there is no limitation on imagination unlike the full access pupils who's imagination appears to have been restricted to their prior knowledge

of the computers uses. The future of ICT within the education system is constantly changing, goalposts regarding results are always moving, software is always being upgraded, and the computers themselves are becoming more and more powerful, however one thing remains constant, pupils of all abilities can achieve in ICT if an open door policy is maintained. ICT crosses all boundaries from race to age from high ability pupils to low ability, all this is seen in an ICT room or lesson.

One glance at a chat room proves that race or religion, is not of paramount importance, the interaction with other people is the first concern. The ability of the pupil to read or spell in a chat room is overlooked and ignored. The shorthand speech that is used is phonetic and therefore accessible to all ability readers. The speed of response is not important it's what they have to say that counts. Nobody writes letters anymore, I've often heard, yet the use of e-mail is increasing at an escalating rate.

There are Internet rules that have to be followed, their users monitor these, this teaches that rules are not to be broken, but understood if you want to continue. Walking down



Children at a school for the underprivileged in India

Digital Opportunity Channel

the right side of a corridor can't be maintained, yet all pupils can tell you the rules for the Internet and why they should be adhered to. Emphasis on the methodology used within ICT, as well as the end result carry an equally strong emphasis within the national curriculum levels and as such all ability groups can benefit from this.

Mitra states that teachers who are adept at constructivism are generally not easy to find and whilst this may have been the case in the past. I would like to point out that as ICT is a dynamic ever changing subject, so has been the quality of the teacher training courses of today in the UK. More emphasis is constantly being placed on the methods of learning mentioned by Mitra. What he calls Minimally Invasive Education, I would like to call one of many methods of good teaching practices that should run in parallel. Teachers are being asked continually to improve and question their own methodology so as to include all forms of learning practice. However, it must be accepted that ICT taught as a discrete subject does carry with it many benefits, that other subjects do not enjoy. One of the most difficult tasks a school has is encouraging self motivation for learning among its students, the most difficult task the ICT teacher has, is harnessing all that self motivation in a secure environment in such a way as to enhance the students education. The problem is not getting the students to learn ICT: it is trying to slow the students down so that they understand more fully what it is they have learned. ■

