

The Social, Moral, and Political Implications of Mathematics Teaching

(Mathematics is an important subject in itself, but it is also very often used to assess the intellectual capacity both of individuals and whole groups; in general, the following consequences result from the method of instruction used.)

from instruction by the teacher	from discussion of text by whole class (aka 'Socrates Method')
creates three social divisions in any average class	heals divisions; comments now refer to whole class
<p>Div I : P - Can <i>articulate</i> in teachers' language. S - Learns <i>selfishness</i> to defend advantage; exhibits <i>lack of interest in other pupils</i>. M - Admires teachers: until autonomous.</p> <p>Div II: P - Can <i>imitate</i> teachers' language. S - Learning <i>dishonesty</i> to conceal lack of understanding; strong group identity; learning that <i>obedience</i> is accepted by authority as <i>understanding</i>; M - Whole group <i>rejects the obviously</i> <i>bewildered; likes few teachers; readily flouts</i> <i>authority; openly despise 'swots' and 'thickies'</i>.</p> <p>Div III: P - <i>Cannot understand or obey instruction</i>. S - Rejected by others; <i>socially withdrawn</i> or <i>disruptive</i> to stop further discrimination. M - <i>hates teachers and system; sees self as victim</i>.</p>	<p>P - <i>Beginning with poor language skills</i>; learning to overcome difficulties of translating written text <i>into own words; confidence increasing</i> by seeing and hearing others struggling with the same.</p> <p>S - Learning <i>honesty</i> in admitting errors and in not understanding; being <i>respectful</i> of others' attempts; <i>patience</i> in listening; <i>care in criticising</i> and also in <i>accepting criticism</i>.</p> <p>M - Learning the joy of <i>co-operative effort; the value</i> <i>of correction and advice</i>; increasing pleasure in group's and <i>personal success</i>; becoming capable <i>learning autonomously</i>. Enjoying lessons!</p>

Key : P - dominant personal characteristic; S - dominant social trait(s) ; M - dominant moral response

them, with understanding, you might as well not be there. Now, pick up the book - and read."

The lesson continued successfully; but I should have tried to explain this first. That is what I now recommend.

It is not strictly necessary for everyone to have their own text-book. They can share. It is a good idea to keep a list of who has read already, and to try to ensure that everyone has a turn. You will soon discover that some read fluently; some excruciatingly; some too slow, others too fast. Praise clear, steady, lively reading. It must attract emotion as well as thought. You can demonstrate this by reading a really boring text as if you are King Lear or Joan of Arc or it is some mystery thriller. The point is to alert and excite the emotions, to make any text more memorable. It must be fun to read. Make it so.

But a pupil's reading should never be too long. Sometimes a few words may require an explanation, although often to you they may be most obvious. Be sensitive to text that is irrelevant, or poorly written, or just plain boring - and, when it is, say so. You are not there to defend a text, only to help your class understand what it may mean. If a text is really bad, correct it; but ask the class for suggestions as to how they would correct it. They must learn that writers also are fallible.

I cannot emphasise enough how important it is not to show any surprise when the first person or the next or the next whom you ask: "*What does it mean?*" helplessly answers: "*I don't know.*" This is entirely natural. Say so; before asking the reader: "*Please read it again.*"

Obviously you will not show amusement, ridicule, frustration, impatience, disbelief, or anger. The whole tone must be of relaxed and interested exploration of the ability of the class to learn. If someone is disruptive, ask that person to read or explain. Your example is absolutely vital. Everyone is learning from you as well as from the text. That *you*, the authority over *them*, listen peacefully, and interject helpfully, whilst they help each other to reach an agreed conclusion - even if this is only temporary - gives them a tremendously powerful social model to remember. They see and experience the sheer difficulty of achieving agreement. They will later be more cautious about dogmatism. Nor is it always the cleverest in the class who will make the most useful contribution. Occasionally it may be some shy soul who has really never before got anything right. When they make the contribution that everyone agrees is useful or right, you will have helped to change that person's view of themselves for the rest of their life.

Finally, once any necessary examples of practical work have also been read and explained, let them decide which exercises they will do, both in class and at home, and let them get on with it, where necessary helping one another. The noise level may be high, but most of it will be useful noise.

Of course there will be the occasional lesson failure. This is normal too, and when they happen, you can always revert to the time-honoured activities numbered one to three in our list. As we have seen, they are not very effective, but all classes are used to them, and therefore well understand the discipline that they require. You can therefore always create more order whenever you wish.

So, now I think you know almost as much I did when I began. Try it. Find out what it is like *really* to participate in learning. You will be surprised how often you will learn more as well.

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GIVING PEACE A VOICE

Teaching the Socrates Way

The Socratic Methodology at work

*"Simply by continuing the best practice of Primary teaching in
Secondary schools we can save children from oblivion."*

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Dear Teachers, Students, and Parents,

This guide was first created for a consultation funded by the Qatar Foundation in St Georges House in Windsor Castle in January 2009. It was supported by university professors from six countries and attended by seven ambassadors.

A very common comment about its fundamental thesis is: *"That's what I do to learn anything properly! Possibly it's because I'm a bit dyslexic."*

Possibly everyone is a bit dyslexic: whenever we need to focus our attention a little better, to engage more faculties, to get our minds really to understand the words.

Very often we do this by reading aloud. We reinforce our capacity to remember anything by talking about it as we are doing it! This experience should have led long ago to an understanding of why children need to do this more frequently as well. The famous language theorist Noam Chomsky thinks this is how language first evolved. In primary schools most learning is achieved through frequent dialogue and class discussion. In secondary school this enormously valuable practice is often forgotten, even suppressed - and it is then that children start to fail!

I believe that simply by continuing and refining the best practice of primary school in secondary schools we can rescue thousands of children from oblivion. The key is to *use their textbooks* as the basis of their discussion.

What could be more practical - or more useful? Pupils soon find that they can actually learn alone! But although this has been understood by all of you: by parents and teachers, teachers' assistants and even teachers of teachers' assistants - and although you all want to try to teach like this, several have admitted that they are nervous about beginning. I should have anticipated this and I apologise that I did not. The workbook tells pupils why and how to learn like this. Some earlier articles of mine have described my own class-work. But there is still a need for more detailed and more sympathetic instruction. This is what I shall now try to produce.

Since I do not know whether you are working with 9 or 19 year olds, or where you are working in your subject, this must be a kind of primer that you will add to and modify according to your own experience. First I can explain more precisely *why* you should teach like Socrates - and why your pupils should definitely want to learn like this. Then perhaps, from my own experience, I can tell you *how* to conduct successful, effective, and enjoyable lessons for the remainder of your career.

Why?

Every teacher should know statistics like these. These are provided by the National Literacy Trust in London but they are entirely typical. They represent the capacity of the average child to retain knowledge after different kinds of class activity.

1. Listening	5%
2. Reading	10%
3. Audio-visual	20%
4. Demonstrations	30%
5. Discussion	50%
6. Practice by doing	75%
7. Explaining to others	90%

Possibly because they do *not* know these values, many people still believe that 'proper' teaching must emphasise mainly the first three activities. Whole classes should learn by listening or reading (silently), or by watching their teacher writing or drawing diagrams on a board and (also silently) copying this down. Of course such lessons seem impressive. The teacher is totally in control. The class is totally occupied. There is no fooling about. There is no talking. Everyone seems to be busy.

But how many are learning anything? The hard fact is that these three activities are *up to twenty times less effective* than the last three. Any teacher using them exclusively is a disaster for children.

Modern teachers teach classes of youngsters in which there will always be a few who find it difficult to understand the meaning of a single sentence. Most, of course, can read, silently or aloud. They recognise the words. They can also pronounce them. The crucial fact is, however, that many just *do not comprehend what the words actually mean*. By the end of a paragraph they may be completely lost.

We blame such children for being inattentive, for being bored, disruptive, and even destructive. They often are. But in truth their situation is really terrifying. They sit through lesson after lesson in a daze. They may act as if they understand. They may have learnt to do what is praised, very often without the slightest idea of why it is praised. They have come into school with almost no experience of reasonable conversation, of the use of language to communicate, of the need for tolerance of mistakes, for patience in constructing comprehension and achieving agreement. This is not their fault. Almost certainly they did not choose to be like this. Nor do they want to fail. But unless they are taught to understand they will fail. It is inevitable and terrible to watch. It is also entirely possible to prevent it from happening.

The most effective lessons ask children to read a text aloud, to show their comprehension by explaining in their own words what it means, to demonstrate their understanding by discussing their ideas with others, and then by using their ideas. The reason for this is not difficult. Knowledge is associations. The brain best remembers whatever has caused it to combine the most functions, to create the most associations. Sitting silently whilst listening and watching a teacher - however talented the teacher - does not do this. Reading and listening, reading aloud, discussing the meaning, searching for a better explanation, giving examples, explaining to others: these use far more energy; they involve many more functions of the brain, create many more associations. How many more? We can give a rough approximation. Up to twenty times more energy, functions, and associations: which is why Reading Aloud (and then Explaining) makes it far more certain that your pupils will Learn?

How?

Whatever their age, they deserve to hear much of the explanation you have just read. It has convinced you. You should be able to convince them. Incidentally, the first time I dared to begin Reading Aloud with a senior class, I did not do this. Within minutes, there was an explosion of rage. One girl slammed down her book. *"We're not supposed to be able to read this rubbish and understand it."* she shouted. *"It's your job to teach it to us!"*

"Listen," I replied, as calmly as I could manage, *"Within a year you will be sitting alone in a study bedroom in some university, and the room with you will be a pile of books."* I paused whilst the class contemplated this very real possibility. *"There will be no-one else in the room. Unless by then you can open books and read*