You are never too late to learn... OR TEACH

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It all started with a telephone call about three years ago. Out of the blue. I had been retired for a number of years after teaching mathematics for forty years in school, teachers college and university classrooms. The call came from the programme coordinator of an organisation called the Seniors Education Association, a group of retired teachers who meet regularly (at least once a week) to attend educational talks on all sorts of topics and undertake excursions of an educational nature. I became aware that there are hundreds of retired teachers in our community who want to continue to learn, or at least to have their intellect stimulated. Some join clubs or read books or do crosswords or even surf the net when they retire, but these folks wanted to be stimulated with some mathematics. "Give us a presentation on some topic of mathematics." I must admit that I was initially surprised that any group of people let alone retired teachers actually wanted someone to talk to them from that subject about which most people boast of their ignorance (even abhorrence).

It was a tall order to talk about an aspect of mathematics to fellow retirees, some up to ninety years of age, without knowing their mathematical background or their feelings about the area. I had a notion that ex-teachers might have an above average level of numeracy in the broad sense of the word, but I felt that I could not assume a knowledge of mathematics beyond that of elementary algebra or geometry, since many of them might have been former primary school teachers for whom mathematics was not necessarily a central feature of their teaching. I played it safe and chose to present a short discourse on the nature and development of number through the ages. I aimed to keep it light and bright with an emphasis on historical and conceptual aspects of number. It must have gone down well, as I was invited to return later in the year to talk on another topic. This time I chose to discuss the nature and development of measurement, since measuring is something we do every day. Besides, there are many interesting facts and anecdotes which could be quoted to enliven the presentation, most of which are not now nor have been normally included in the school curriculum. For example, why is the length of the Australian coastline indeterminate, and why did the 21st century begin in 2001 and not 2000? And why is the fact that Dunkirk is north of Barcelona relevant to the length of a metre? Once again, my talk fell on receptive ears, for I was invited to return later with a third topic. Given the popularity of "The da Vinci Code", I opted to talk about "Fibonacci and the Golden Mean", with all the usual references to spirals in pine cones, ϕ, Fibonacci sequences and their application to modular architecture by le Corbusier. I was beginning to be convinced that there was an

audience out there for mathematics well beyond the usual confines of school and university curricula.

Confirmation of this came when I was contacted by the coordinator of a group of retired people attending what was called a "College for Seniors". She had wanted to identify someone who could give a course of weekly sessions on mathematics. I had heard of the University of the Third Age, which has branches all over the world, in which people pay small nominal fees to attend classes in a range of topics conducted by a band of volunteer teachers most of whom are retired teachers or lecturers. This group was slightly different. It is organised by a church for people in its wider neighbourhood as a vehicle for continuing learning. Classes are held in languages, poetry, computing, history and so on. The average age of "students" is 80 years of age, but they all have a thirst for knowledge and were keen to have themselves challenged mentally. As with the retired teacher group, I could not make strong assumptions about their background in mathematics, nor their attitudes towards it. After my earlier (positive) experience, I decided to give it a go, and agreed to present a seven-week series entitled "The Joy of Mathematics" covering the nature of mathematics, and an introduction to number, calculation, measurement, geometry, statistics and Fibonacci & the Golden Mean. About forty people attended the first session in which I explored with them the features of mathematics as a language, as a way to solve problems, as a way of thinking and so on. To my surprise and delight, they seemed to enjoy the experience and burst into spontaneous applause at the end of the session. It was, according to some of them, the first positive experience of mathematics they had ever had. Several of them told me that they tried out some of the problems we looked at with their friends and grandchildren. For my part, it was probably the first time I had received applause at the end of lesson. Not the usual response. My only concern was that my presentation was made in the church itself, with me at the lectern and the class in the pews. (I told them at the first session that we would be celebrating "Holy Maths" and I have often been accused of preaching.) This meant that there was very limited opportunity to undertake practical activities. Mostly I had to rely on duplicated handouts, a whiteboard, overhead projector and data projector to support me.

The rest of the sessions (supplemented with short "homework" assignments) went well and the level of attendance was generally maintained. Not only that, but those who attended said that they looked forward to coming, and continued to respond with enthusiasm. So much so that the College coordinator suggested that I should return the following year with another mathematical offering. Buoyed by this vote of confidence I contacted the local University of the Third Age (U3A) and was invited to put forward a programme of sessions on mathematics, which was apparently a novel area. There had been a steady stream of offerings in science over the years (apart from the very popular subjects in languages, literature, history, music, computing, crafts and all those other areas popular in adult learning organisations), but never any in mathematics. The clientele in this case were on the whole better educated and younger, although most were retired. The class was smaller because of the restrictions of space, and pace more leisurely than at the College. However the response was also positive.

While this was going on, I received another invitation from a local community learning group also based at a church. Word had passed around that I had some entertaining and informative mathematics to offer. This provided another opportunity to present similar material under the title "Mathematics can be fun". It was somewhat unusual for me (and others) to see my sessions
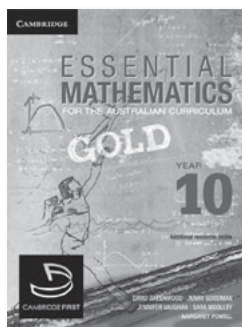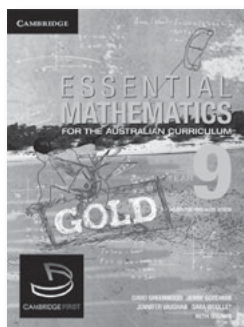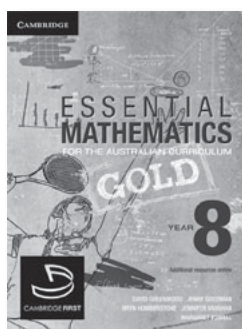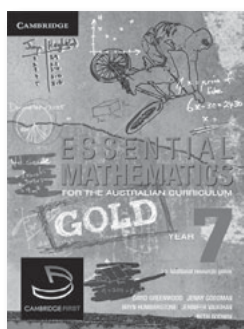
advertised on a large placard on the main road outside the church. It led to a series of well-received classes, held in the body of the church. People attended for tea, coffee and cake and an hour of mathematics for a nominal cost. As before, I was surprised at the positive response by those who otherwise would have said that they did not really understand or appreciate maths at school. A typical case was that of a lady who stated with some feeling that for the first time in her life, she now understood Pythagoras' Theorem. Many were keen to share stories of their mathematical successes (and failures), and how they felt they could engage with their grandchildren on some mathematical topics with a little more confidence than previously.

Success breeds success, they say. I have just completed a second series of sessions at the College for Seniors, this time with a focus on Geometry and Art, approaching such topics as construction of polygons and irrational lengths, symmetry, tessellations, proportion and perspective. Rather more visual than interactive, it was warmly received and has led to yet another invitation to present at the local community group.

It seems that there are adult learners and certainly retired ones, who are more than willing to continue to learn mathematics for its own sake, as a source of intellectual stimulation and not for its role in practical application. More than that, for retired teachers who still find mathematics challenging and interesting, there is a potentially enthusiastic audience of people in the community who actually want to learn mathematics and to be excited by it, even though it is not required for them to get a job or pass an exam. Retiring from teaching is not the end of a meaningful engagement with mathematics, and there are many others who wish to share it with you. You only have to make yourself available.