

Convocation Address – II

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Early Education as seen by a student

In giving this convocation address, I had to decide whether it should take the form of a sermon or whether I should place before you things which are individual experiences of others. There are enough and more sermons. Individual experiences of others are best placed before you by them. I, therefore, will not preach to you, neither will I attempt to place before you, individual experiences of others. I will, instead, tell you about what I have practised, and leave it to you to determine whether such practices have been fruitful to me and therefore, whether they could be of any use to you.

What I know best are my own experiences. These are the experiences which I can explain best. Those of other individuals, whether considered important or not by others, will be found in their writings, memoirs and autobiographies, if they have considered them to be important enough.

It is not my intention to place before you anything highly technical. The audience before me, specially those who have graduated today, will be more interested in finding a suitable means of livelihood as soon as possible. They may also settle for some form of employment. What is unfortunate is that, they will look for employment more in accordance with what they have got today in the form of a scroll rather than in relation to the competencies they have acquired over a long period of time. Most of the parents and well wishers who are here will be more interested in getting back to their homes as soon as possible than in listening to orations. I do not blame them at all. I will therefore, make this oration as short as possible.

I have been a student all my life. This learning process is well known to have begun from the time I was in my mother's womb. I will speak about some recorded scientific findings in this connection and give you the references so that you can decide for yourselves whether to take them seriously or not. I therefore, will make a very humble request to give me a patient hearing.

In my professional life, I have been a teacher. This brings to my mind the well known adage, "*Those who can, do. The others teach*". My former professional colleagues who are present here are those who can do and they have amply demonstrated that fact. They can teach, and that too, in a way different from what is available in the conventional Universities. It is not everybody who can impart knowledge although they may be very knowledgeable.

Before I gained employment as a teacher, I had been teaching many. My favourite subject was and is Mathematics. As a student, I also found Physics and Physical Chemistry up to the level of the First Year in the University to be very easy because they required very little memory power. I had not earned any money by this activity. It goes back to my school days, specially to those years prior to joining the University. My students were mostly my own class mates and also some neighbours who thought that I could be of help. Some were also interested to find out whether I was a fake. They used to bring problems from First Year University Tutorials, and fortunately for me, not from later University years.

Some were within my reach and I am sure that the problem posers would have been disappointed. Mathematics is a subject which is not studied. It is an activity. The more one indulges in it, the better would he be at it. Such indulgence need not take place when one is seated at a table with pencil and paper. Most of the time, the activity can be confined to one's head and this can take place anywhere and practically at any time. The famous story about Archimedes where he was able to solve a problem which had been baffling him for a long time and that too when he had immersed himself in a bath tub should be an eye-opener. The best times to place the brain on gear are those when one feels comfortable, and the time when one has a comforting bath is only one of them. I have put this in to practice with very good results.

The library of my school had no books to help me. There was, at that time, only one book-shop in Colombo where one could go to the shelf and select any books he would need. I made good use of it. I did my reference work there. The sales personnel there, to my good fortune, were too busy with other things, and therefore did not notice that I did not buy any books even after spending a considerable amount of time in the shop. I continued to disappoint those who thought that I was a fake.

Why was it that I found Mathematics to be a very easy subject when for a very large majority, it is a nightmare? I would not go to the extent of claiming that it is something I have inherited possibly through my voyages in 'Sangsara' although, I find that the concept of rebirth and therefore voyages in *Sangsara* are quite acceptable, but not for the reasons described-in the '*Deegha Nikaya*'. In one of the '*Suthras*' in the *Deegha Nikaya*, there is a reference to a dialogue between a King still to be crowned and an '*Arahat*'. The King expressed his doubts about rebirth and had stated that, for such and such reasons where he had given several such reasons and described them in detail, he was not prepared to accept the statement that there is rebirth. The *Arahat* had explained the fallacies inherent in the assumptions he had made in coming to those conclusions in each and every case. The *Suthra* concludes with the obvious statement that the King was convinced about the explanations given by the *Arahat* and that he left the dialogue convinced about rebirth. Why I find this acceptable is because my fortunes and misfortunes are not attributed to the actions of any third party but are placed fairly and squarely on me and me alone. I and I alone am responsible for my destiny. I must acknowledge the fact that it was one of my undergraduate students who asked me whether I had not read the *Deegha Nikaya* when we were talking about the concept of rebirth. I am happy that I subsequently read it.

At this stage, I would like to quote from an internet document I came across.

"It is a well known scientific fact that Genes and environment interact at every step of brain development, but play very different roles. Generally speaking, genes are responsible for the basic wiring plan for forming all of the cells (neurons) and general connections between different brain regions, while experience provided by the environment is responsible for fine-tuning those connections, helping each child to adapt to the particular environment (geographical, cultural, family, school, peer-group etc.) to which he belongs. An analogy that is often used is a phone network: genes would specify

the number of phones and the major trunk lines which connect one relay station to the next. Experience provided by the environment would specify the finer branches of the net-work- the connections between the relay station and each person's home or office".
(<http://www.zerotothree.org/brainwonders/FAO-body.html>).

I would like to get back to my question as to why I found the subject Mathematics to be very easy, in the sense that I was quite comfortable with it. It could be due to several reasons. Firstly, during my very early years, and that too even before I was able to speak as a child, I have been told by my mother that I would cling on to my father as soon as he returned from school after his teaching duties and say 'bahung bahung'. My father, I was told, had been carrying me and reciting 'Jayamangala Gatha' whenever the time permitted. I would have been listening intensely to the Jayamangala Gatha and therefore would have developed the habit of listening intensely even before I could properly speak as a child. This is well supported by neurologists who claim that the listening process of a child begins when he is a foetus in the womb of the mother. This was the cultural and family environment to which I got exposed. Classical music or any other soothing sound of a continuous nature would have, I believe, had the same effect.

Secondly, my mind goes back at least as far back as 1943 when I was not yet 8 years in age. These were the war years and my father was a Warden of Air Raid Precautions. He used to go in the evenings for meetings connected with his voluntary position and return only late in the night. The six children would sit on a mat and around my mother where she would be reading from the 'Pujavaliya'. I was so scared of the loneliness without the father at home, pitch dark surroundings and the sound of the crickets which signified that it was night that, the only way I could detract myself from the frightening surroundings was by listening intensely to my mother. This too would have trained me to be very attentive, and as a school boy and in my later years, I found this to be a great asset.

Thirdly, during my 'formative' years, specially after I came to Colombo for College education as a boy not yet nine years in age and after getting promoted to Grade 5 in a vernacular school, I found it impossible to converse in English with my class mates. There were only a very few who used English for conversation and the vast majority had backgrounds similar to mine. Therefore, I spoke very

little English, but was relieved that there were many who were like me and they provided me with comfortable company. On the other hand, I realized at that age, that competence in handling the 'Kaduwa', as it is known today, would be very useful, although I did not know what it will be useful for. It could also have been due to personal pride. I am a kind of a perfectionist and therefore, an utter misfit in the society of the present day. I may have thought that I should be able to speak well in English. Accordingly, I decided that I will speak to myself in English. This was dangerous. I had come to a so called prestigious College from the village. One can just imagine what the villagers would have said if they saw me moving my lips as if I was speaking to a non existent audience and that too, without any sound. I had to master the technique of speaking to myself without any sound and without moving my lips. I was very successful. Even now, I resort to this technique. With the kind of gadgetry that is freely available today, it will not be very difficult for each one of you to gain access to a tape-recorder, record your speech, play it back, edit it as much as you want and make corrections wherever you think that corrections are necessary and listen to it again. If you can get the assistance of a third party, so much the better.

The fourth factor could be the fact that I used to travel over a large distance by bus to spend the weekend with my parents, brothers and sisters. Throughout my school days, I had to spend a lot of time commuting to school and back. Rather than try to enjoy the surrounding scenery which was, more or less static, and therefore, once seen was more than enough, I used not only to speak to myself in English, but also to gradually cultivate the habit of thinking intensely about various matters which came to my mind. I feel very sad that this ability I had up to very recent times is now getting weaker and weaker. I take solace because of the absolute truth in the saying '*Sabbe Sangkhara Anichcha*'.

I have never got through the G.C.E. (OL) Examination or the G.C.E. (AL) examination. I have never been trained as a teacher. I only served as apprentices to some very good teachers at the University. I have been exposed some very good teachers at School as well, and also to some whom I would not try to follow. Just as an example, one teacher accepted, then and there, to solve a mathematical problem. Whenever he failed, we, as school boys, laughed. He laughed with us. What did we learn? We learnt to face a problem then and there. When he succeeded, we admired him. He always used to say that he was once a school boy, and that he was then like any one of us. We admired him. What did we learn? We learnt that

we also could succeed like him. On the other hand, there was a teacher who also encouraged us to bring problems to be solved by him. Whenever he failed, he would say that we would not get such problems for the forthcoming examinations. What did we learn? We learnt that the problems would not end with those at the forthcoming examinations.

At this stage, I would like to quote from another internet document: 'Early Brain Development- What parents and caregivers need to know' by Phyllis Porter, M.A. (<http://www.educarer.com/brain.htm>).

"There is a four year period of 'potential' growth, which is the most critical period of human development. This time is from conception until about the third birthday. During this time, all things are possible-learning to walk, learning to talk, learning how to 'fit in' to society. There is a need for many experiences in order to master skills (Families and Work Institute, (1996): Rethinking the Brain-New. insights into Early Development; Conference Report- Brain Development in Young Children; New Frontiers for Research, Policy and Practice). Maria Montessori, years ago, called this time that of the ABSORBENT MIND (La Mente del Bambino). Her conclusions were similar to what scientists are finding today.

"By the 17th week of pregnancy, the foetus already has 1 billion brain cells, more than the adult brain. These cells are proliferating at a rate of 50,000 per second. These cells are not in the right place and only after they are formed will they travel (cell migration). At birth, the distinct areas of the brain are all in place, however, much growth will still occur. The brain is the only body organ incomplete at birth.

Within each brain area are millions of neurons (nerve cells) which are connected to each other by synapses. These trillions of synapses and the pathways they form make up the wiring of the brain. The number and organization of these connections influence everything from the ability to recognize letters to the maintenance of relationships. Neurons develop rapidly before birth. After birth, brain development consists of wiring and rewiring the connections (synapses) between neurons" (www.iamyourchild.org).

New synapses are formed while others are pruned away. Between birth and eight months, the synapses are formed more quickly. There may be 1,000 trillion synapses in the brain at 8 months.

After the first birthday, pruning occurs more quickly. By 10 years a child has nearly 500 trillion synapses, which is the same as the average adult. Pruning occurs for about 12 years but the brain maintains flexibility for future learning.

Early experiences, both positive and negative, have a dramatic effect on this formation of synapses. The brain operates on the 'use or lose' principle. Only those connections and pathways which are frequently used are retained. This is not a cause for panic however. Most of us keep enough synapses to do very well in life. Learning languages is an example of this principle.

At 3 months, the brain has the potential to distinguish several hundred spoken words. Over the next few months, the brain organizes itself to recognize only the sounds it hears. During early childhood, the brain retains its ability (plasticity) to discriminate sounds it has discarded (i.e., not yet organized). As an analogy, think of putting something into the 'trash' on your computer. You can still retrieve that information out of the trash as long as it has not been deleted. This is why young children can easily learn foreign languages accent-free. After age ten, this plasticity is lost (the trash was emptied). Children can still learn a foreign language, but more effort is required.

It is from early infancy to early childhood that these vital connections are made permanent. As we mature, the brain physically changes due to outside experiences. The first three years see the most rapid changes of all life due to the bombardment of experience (everything is new!) At this time, the brain is most flexible and prepared to learn.

In developing the brain of the child and his character, are we making good use of his age as one parameter and the appropriate environment and experiences corresponding to such age as the other? In human resource development, any activity affirmatively directed towards such development should be targeted to take place at the most appropriate age of the subject in order that one may get the best return. According to the above scientific findings, the first three years see the most rapid changes of all life due to the bombardment of experience.

According to Karr-Morse and Wiley (Karr- Morse, R. and Wiley, M. (1997)- *Ghosts from the nursery*- New York: Atlantic Monthly press.), in respect of quality care, for every government dollar spent on preschool, society saves seven dollars. They say that the professional organization of prison wardens correlates the need for investing money in the first three years of life as a prevention with a later necessity to build prisons. They further say that experiences from the prenatal period through the third year have direct results in the production of criminals and anti-societal people. The above ratio of one to seven should be, more or less, independent of the unit of currency, and therefore, should be applicable even to a country like Sri Lanka. I do not know whether any such studies have been undertaken in Sri Lanka. However, it seems obvious that, higher the effort taken to properly develop the brains and character of children before they are three years of age, the lower would be the investment for law enforcement, criminal adjudication and opening of prisons. What are we doing about preschool education? In the United States, the Carnegie Report of 1995 has estimated that 40 % of all infants and toddlers are in care that is actually destructive to them. In Sri Lanka, day care centres and preschools are being run by housewives whose only qualification for running such centres and preschools is that they were mothers once. Some have not even been mothers and some are paid employees of the owners. The motive for running such centres and preschools is profit and there is a rapidly growing demand for such organizations. Infants and toddlers who cannot be brought up by their own mothers run the risk of being exposed to destructive experiences in the hands of untrained caregivers.

My parents could not afford to buy toys for me. In fact, I was less than four years old when the Second World War had started and this continued until I was about 10 years in age. Even food was scarce then. I do not know what it would have been like for children in Colombo. What I learnt later was that schools had been evacuated to cities outside Colombo, and that Ananda College had to open up branches in cities like Gampaha and Elpitiya. In fact, when I joined the College in January 1944, the main buildings were under the occupation of the Army and our class-rooms were in cadjan sheds. As a child, I would have been instinctively directed towards the construction of toys for my own amusement. The implements I had at my disposal were the kitchen knife and my mother's pair of scissors. The toys were turned out of dried branches of coconut trees

and arecanut trees, pieces of tin which came out of the lids of canned food, empty spools yarn thrown away by my mother and discarded match boxes. The village gave me an ample supply of assorted pieces of wood which had to be fine tuned with the help of the kitchen knife. The lids of the empty cans were cut by bending and unbending many times. Plenty of bamboo of the thin variety was collected by going upstream along the many streams in the village. I do not remember as to how I had access to a few wire nails. The rubber estates in the neighbourhood provided latex as gum and also dried latex as elastic strings. A piece of dried latex, an empty spool with suitable cuts round the circular edges, a piece from a candle with the wick carefully removed and a piece of ekel were all the requirements for the manufacture of a battle tank which could go up an incline or even over an obstacle. The possibilities were immense. The thin bamboo was turned into air pistols or water cannons. Nothing of this sort would have been possible if I had to be spotlessly clean and I have been reprimanded by mother many a time for being dirty and more for making her kitchen knife and the pair of scissors blunt. I ended up as a sort of a handy man. I was surprised to come across many educated people who have been in Colombo all along but are unable to use a screw-driver or a spanner.

For little children, touching objects is very important. This is how they explore the surroundings and get a feel of the hardness or softness of objects, their texture, whether they are hot or cold and a host of other experiences. Children love to play with sand and even mud. They cannot do this without their hands getting dirty. Are we going to deprive the children of such rich experiences which are very important for the growth process?

I have even heard of a well known person who comes on TV and says that, if a child wants to play with the flame of a candle, he should be allowed to do so. I have no suggestions in this connection. However, the truth is that I have literally burnt my fingers, got injured in using the kitchen knife, had the sewing machine needle going through my index finger, smashed my fingers in not getting the proper aim of a hammer and met with many accidents in attempting to make my own toys. Fortunately, nothing of a serious nature happened. Growing children need many experiences for their proper growth where such experiences cannot be acquired without getting their hands and even clothes dirty. What is the true position today? Throughout their school career, they are made to wear a uniform which has to be maintained in a spotlessly clean condition. They would hate to handle any implements or touch anything that would soil their hands. Sri

Lanka is a country where, except at the top of a rock, conditions are very conducive for plant growth. However, school children are affirmatively pushed away from agriculture and horticulture by inculcating in them, the spotlessly clean uniform culture. Is there something wrong? I have heard many a young engineering graduate appearing over TV and saying that his practical experience is minimal. I entered the then University of Ceylon to be an Engineer. After winning the First, in Engineering Scholarship awarded to the best Engineering student at the First in Engineering Examination, I opted to read for the Special Degree in Mathematics. I believe that, if I became an Engineer, I would not have been inhibited by the spotlessly clean uniform syndrome. I have no solutions to this problem but strongly believe that there is a serious problem which requires immediate attention. Before the Peoples' Republic of China became a world power, the pictures I have seen of Chairman Mao and its peasants showed that they were wearing similar uniforms, all of the same colour, this colour not being white. China would have preferred to be economically developed and independent before it could cater to sartorial pluralism.

I would like to make a side remark at this stage. During the war years, there was a severe food shortage in the country. After school, my father used to work as a cultivator in some land which was owned by somebody else, and most if not all of our requirements of vegetables, yams and fruit came from that home-garden. In 1973, we went through a similar period and it was my turn to cultivate a home-garden and this was an activity which I enjoyed thoroughly.

Scientific evidence was placed before you that the best time to learn languages is before a child is about 10 years in age. At present, we are on a powder keg. Lack of understanding of Tamil by the Sinhala and vice-versa has gone a long way to create mistrust among the people of this country with disastrous consequences. Are we doing enough to solve this problem by exploiting the potential of children before they are ten years of age to learn languages? If nation building is relegated to second place, there might be no nation left. What are we doing? The school children are made to walk the streets with very heavy school bags carrying books on a variety of subjects, and they are made to study for what is called a Scholarship Examination where scholarship plays no role, but only rote learning is promoted. The overwhelming success of the tutoring business in providing classes for students sitting the examination is ample proof of this. The child

does not develop his thinking faculties, originality or personality with this futile exercise. I firmly believe that nothing would be lost and much would be gained if attention is paid more to literacy, numeracy and computeracy during the first ten years of a child's school life. There is no point in having any education system if the products of such an education system cannot walk on the streets properly, cannot strive for individual contentment or cannot have acceptable patterns of personal behaviour. By the time I passed my eleventh year, I had got out of Primary School, and what we learnt during the period and what is left with me are numeracy (arithmetic and mental arithmetic), literacy (english and sinhala), poetry (english and sinhala) and religion.

I would not like to let go, my feelings about learning languages. Today, children at very tender ages are exposed to television. During news bulletins, it is very common to see world leaders and others being interviewed on a wide variety of matters. Do we not see an Indian speaking English as an Indian, a Japanese speaking Japanese English and a Frenchman speaking his own variety of English? Do we not see that the speaker is more interested in expressing his ideas rather than sticking to a particular accent or even to the rules of Grammar? I met a Japanese Cloud Physicist when I was at Imperial College. If he was asked what he had for breakfast, he would struggle to answer that question. However, if he was asked about the research in Cloud Physics which he was doing, his replies were prompt and clear. He did this in his own English. One of the main obstacles preventing our citizens from using English for purposes of conversation is the unnecessary social stigma attached to the use of the '*Kaduvva*' unless the Oxford accent or the correct rules of grammar are used. Fine tuning can be done later, but let us get conversation going.

With all the good intentions put into practice, all our children are not going to end up as scholars. How each person ends up will, to a large extent, depend on the experiences he has been made to go through during his childhood. Should not we, therefore, make available to the growing child, a wide variety of experiences, so that it will be possible to determine where he will be most comfortable? He will do well only in an area of activity where he feels comfortable, and he will stick to an area of activity only if he does very well in it so that he can get some personal satisfaction by engaging himself in that activity. Should we not, therefore, make the early education of a child, activity oriented as much as possible? The challenge to designers of school curricula will then change. They will have to design activities which will enhance not only the process of acquisition of knowledge, but also that of the

acquisition of skills. Children love games and properly designed games can be used for both physical and mental development. If such activity is coupled with plenty of outdoor activity, children also will undergo healthy development. When Prince Siddhartha had to meet prospective fathers in law, he was subjected to a '*Shilpa Dekweema*', and this would have involved much more than knowledge. The knowledge of the theory behind Archimedes principle and forces on moving objects in water cannot produce a good swimmer. He has to get into the water and swim. I learnt to swim in little pockets of water which had been made by the villagers in the streams in the village for their bathing and washing purposes. I did not even know of Archimedes then.

This address has to end somewhere. Some of my past students have been very critical of me in the sense that, in their opinions, we, as their University teachers should have had the foresight to see what kind of life they would be leading at least for a few years into their futures and that we should have assisted them to mould their characters in such a way that they would have fitted in to the emerging trends of the future. I have failed miserably in this. We told them to abide by the law. We told them to respect the rights of others. We told them not to take the law into their own hands. We told them to be .absolutely honest and truthful. We told them many things. Have we helped them to mould their characters and patterns of behaviour in such a way that they will successfully fit into the society of today and lead happy and contented lives? I will leave you to answer this.