

Educating for the 21st Century: Notes of a Native Son

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Introduction

Good Morning! I am pleased and honored to be here, and I want to thank all those who have made this possible – **Leonard Lewis** and his team for organizing this event and inviting me to it; the principal of this historic institution which, for us Berbicians, is *the* “BHS”; the other members of the panel, the honorees from last night; and all of you for choosing to attend the event.

Thank you very much!

This is only the 2nd time that I am speaking in public in Berbice! The last time was more than 20 years ago, when **Errol Alphonso**, then Mayor of New Amsterdam (N/A), arranged a series of events: at the Town Hall; then at Mission Chapel School, where I was a pupil and my father, **A.N. Thomas**, was Headmaster in the 1940’s and ‘50’s; then here at BHS; and then, as I fondly remember it, at his home next door, where his wife, **Gwen**, laid down a **spread of delicious food** that I can still taste!

Brief Personal History

Today’s topic is “Education”. So I hope you will allow me a few minutes of personal privilege to acknowledge my own educational roots in Berbice, and some of the people and institutions that played crucial roles in my development.

My parents created a **happy home in Vryheid**, as I mentioned at our Awards ceremony last night, there were a few elements in the home that, I think, helped make me what I am today. There was the discipline of Saturday lessons in Arithmetic and Grammar, their insistence on fair play and respect for my sisters and everybody else in the village; the ready use of the cane or strap, because my father didn’t want me to become an “educated rascal”; and [cf. Ruthel] the fact that, from age 7 or 8, I used to ride in to N/A to pay bills - \$6.36 at Wrefords, \$10.17 at Mr. Chapman, \$3.33 and Davson’s, etc., and I had to return home with exact change!

At Mission Chapel, I had the feeling that the teachers all thought I was special.

[Teachers like **Ms. Nightingale (now Mrs. Trim)** and **Mr. Semple** (now with an average age of 90!), **Mrs. Angie Fields-Tucker**, **Ms. Austin**, **Ms. Peters**, **Ms. Stuart**, **Messrs. Dolphin and James**, and others. Mrs. Tucker, who is now 86 and lives in Maryland, USA, told me recently that sometimes my father used to send me to her home so that she could supervise my working through a book with problems. But she would take pity on me and allow me to go out and play after what *she* thought was a reasonable amount of work!]

At Queens College, we were exposed to the breadth of disciplines – Art, Music, Woodwork (today’s Machine Shop), Sports, as well as the classical disciplines and the sciences. And we had a Maths teacher, **N.E. Cameron**, who used to tell us that you had to have a **literary flair** when doing maths! He meant that math symbols stood for words or phrases and that, therefore, a mathematical proof needed to read like proper, logical English. Precepts like these helped me through UWI and Cambridge.

In between Cambridge and coming to the USA, I did a postdoc at University College London. One afternoon in early 1969, I was walking down Tottenham Court Road when the thought came to me, unbidden, that I really needed to be in the USA. The research papers that I was reading had addresses like Stanford, CA, Ann Arbor, MI, and Philadelphia, PA; and I felt I needed to be there, rather than in London. Also there was **only one** Black Professor that I knew of in all of English academic history – and that was **Sir Arthur Lewis**, who had the Jevons chair at Manchester and won the Nobel in Economics in 1979. So I figured that my chances of advancement would be very much better in the USA. That was just a thought; I did not act on it at the time.

However, a few weeks later, my advisor, **Professor R.J. Audley**, was invited to a conference in Ann Arbor. He couldn’t go but he told them that I would be an appropriate replacement for him. This was a stroke of good luck for which I was well prepared after that afternoon on Tottenham Court Rd. I went to the conference, there was a job offer from Ann Arbor, and I accepted it – and I even met my wife, **Odette**, there!

As a last example, years later, I was **Dean** of the faculty of Humanities and Sciences at Stanford during its Centennial **Campaign**, when we received a donation from an alumnus to honor our best Teaching Assistants. It is usual to name the honor after the donor, or someone whom the donor wants to memorialise. But I remembered that in **1953**, there was a broadening of access to Queens College and Bishops High School among **less privileged** boys and girls by the granting of what were called **Coronation Scholarships** – in honor of **Queen Elizabeth II’s coronation**. So I decided to call the Stanford awards, “**Centennial Awards**”, to celebrate the **historical moment**, rather than the donor.

These simple slices of personal history do not prove much. However, when I look at the full arc of events, many of which were serendipitous, I believe that my teachers gave me a palette of skills that have allowed me to adapt to situations that could not have been foreseen when I was acquiring those skills. In other words, much of who I am today I owe to my teachers. Many a day, I am aware that the precepts and deeds of these heroes of mine are reflected in the way I interact with *my* students at Stanford University. (Sometimes I even hear myself using the exact words I first heard in a classroom 50-60 years ago!) I am very grateful for their nurturing!

The Importance of Teachers

In today's session, we will rightly draw attention to the need to import 21st century technology - software and hardware - into the lives of our students, especially our youngest students, as quickly as possible. This is a given. According to articles I saw in back issues of *Kaiteur News* (this is my most reliable source of news about Guyana!), the Government endorses this goal in its "One laptop per family" campaign, and in various ministerial pronouncements. Caricom's Council for Human and Social Development also endorses it in statements earlier this year that "the value of an employee will in fact be amplified when they are able to embrace technology and digital literacy in all spheres"; and "[f]ostering creativity from the earliest stages must be a deliberate strategy for our human resource development systems."

Gatherings like this can, at best, nudge decision-makers in some directions rather than others. Given that we all want more technology in our schools, what are these broad directions, and what are some of the ideas or levers that we can offer for this nudging? I would like to highlight two issues, namely, the **training of teachers**, and the **need for a shared vision** of the Guyanese society we wish to inhabit. It is this vision that will put **technology in its proper place** in the curriculum, alongside the so-called "**soft skills**." And it is our dedicated teachers – working with other actors in Government and the Private Sector, who should play a leading role **formulating** the vision, just as they will in **implementing** it.

This emphasis on teachers is not new. My good friend, **Belle Tyndall**, Professor Emerita of George Washington University, who was an influential figure in the educational system of Guyana before emigrating to that of the USA, referred me to a venerable text, the *Handbook of Suggestions*, put out by the United Kingdom Board of Education in 1944. It urged teachers and others to make Education more relevant in a **world in which distances have shrunk and "the people of today are nearer to each other and their lives are more closely linked together than ever before."** This was prescribed reading for our Teachers' exams in Guyana in the 1940's and 1950's – but it could've been written today!

A later edition of this *Handbook* describes the objective of public education as giving "a good start in life to all the boys and girls in our primary and secondary schools. And from this point of view it is **the quality of the teachers, and of the teaching they give**, that matters more in the long run than logistics." This conclusion is just as valid if we were to substitute 'technology' for 'logistics'.

Accordingly, my first attempt today at nudging is to advocate a **renewed focus** on the **education and training of teachers**, and then on **adequate compensation** for our trained and dedicated teachers. My teachers were great in Little ABC, when the technology was slate and pencil, and teachers will be crucial into the **foreseeable future** as our kindergartners get access to **iPads**, and almost everyone owns a **smart phone**. At the intersection of Education and Technology we see more and

more **online courses**, and **open access** to a variety of educational and training materials. But, in order to extract the most value from these resources, we will need a **phalanx of dedicated teachers** who have been trained appropriately.

I hope there is consensus on this broad statement. As for more detailed prescriptions on the 'logistics' of transformation, we will have to sift through a **wide range of opinion** about the appropriate mix of teaching modalities, e.g., 'soft' versus 'hard' skills, and classroom activities versus online exercises.

Also, most of us have been trained in a discipline, because that's how the academy is organized. But a lot of fascinating research and innovation takes place **also in interdisciplinary programs** and projects, like a program on ethics, economics and public policy, or one on engineering and the environment. Similarly, we are seeing studies of young children and teenagers that compare the outcomes of **teaching within disciplines versus teaching to solve a specific societal problem**, like how to get clean water, or how to get preschoolers to eat more vegetables. The latter approach has to be interdisciplinary, and we are seeing that it **promotes conceptual understanding, innovation, and interest in learning** (and schooling) at very early ages.

We should be aware also of the likely **societal consequences of incorporating technology** into the curriculum - what they are and how much we value them. For example, we should not be surprised that it will likely **widen the gap** between the best and worst schools. As a society, we can probably tolerate some gap, but only if the worst schools are also reaping the benefits of the new policies.

These are not settled issues. I was talking to my good friend, **James Croal**, a Guyana scholar from 1961, about them, and we came to the view that our educational planners have to promote sustained discussion and cooperation among all actors - students, teachers, the Ministry of Education, those responsible for curriculum development, and so on. Everyone in the Education sector should share a common vision of where we ought to go.

Vision for our society

A good place to start a discussion of our vision for Guyana is an address given on this very stage less than a year ago. The title was "*Transforming the nation through inclusive education*", and the speaker was Professor **Daizal Samad** of the UG campus at Tain. His message is that **inclusive education** means "including each and every child, each and every citizen into the warm bosom of Guyana." It means planning for all schools, from kindergarten, through primary, secondary, technical and business schools, up to the University of Guyana. Inclusiveness brings to mind other related principles, such as, **equal opportunity, equity and fairness**, and I hope that all these principles meet with general approval, even if there might be heated debate on the 'logistics' of implementing them in specific situations.

Another set of principles concerns the **breadth** of our education, e.g., the emphasis on **problem-oriented learning**, and the **mix of 'soft' and 'hard' skills**. Here too, there is no shortage of wisdom in Guyana. For example, consider two quotes. One is from a *KN* article written 2 months ago by **Clarence O. Perry**: “Students should now be given the opportunity to explore, experience and study *Guyanese* reality in greater depth. ... This inevitably would lead to greater questioning of the status quo that could result in the emergence of various forms of leadership, meaningful civic actions and social developments. ... Attitudes that demonstrate caring, willingness to cooperate, unselfishness, and civic mindedness need to be encouraged, given due recognition, and be rewarded – and the same is true for volunteerism and service that contribute to school and community development.”

The second quote is from *The Primary School*, published in 1931 and a precursor to the *Handbook of Suggestions*. Primary schools “should arouse in the pupil a keen interest in the things of the mind and in general culture, fix certain habits, and develop a reasonable degree of self-confidence, together with a social or team-spirit.” I draw these **parallels** as a way of suggesting that there is a **tradition of educational excellence** in Guyana that should not be ignored as we incorporate new technologies. The important point is that new knowledge and research findings, much of which is being generated by the new technologies, should be **quickly translated** by our teachers, curriculum development experts, and others into **new courses and school practices** that move us closer to the system we envision. And in this translation we don't need to **re-invent the wheel!**

Technology and Schools: Some Examples

For the second half of my talk, let us consider various projects and proposals that fall under the **broad rubric of Technology and Schools**. When I refer to a ‘computer’, I mean some **device with Internet access**, e.g., smart phone or TV, iPad or other tablet, laptop or PC, and so on; which device depends on the context. For example, if the topic is computer programming, then we're probably not referring to a smart phone. We're probably referring to an **iPad** or other tablet, with which we could **introduce the logic of programming to 6-year-olds!**

1. At the least complicated end, there are courses that are ripe for improvement with very little change in the **existing curriculum**, and with the application of **free online resources**. For these cases, the dedicated teacher wouldn't need to consult with curriculum development or budget committees – she could simply download the apps and point students to them. A good example is [Khan Academy](#). Its website states, “With a library of over 4,300 videos on everything from arithmetic to physics, finance, and history and hundreds of skills to practice, we're on a mission to help you learn what you want, when you want, at your own pace.” There is some controversy in the high schools near me, but it's spreading quickly.

2. A more complex example comes from my own **teaching of graduate-level Statistics to social science Ph.D. students**. I am in a Psychology department and

only some of our students have had much experience in matrix algebra and calculus. But all students need to learn **advanced techniques** that, in the 1960's when I was a student, were accessible only to those with a background in matrices and calculus. So, over the last 40 years, my syllabus at Stanford has expanded to include these advanced techniques (at the expense of some outdated methods), and I have had to learn how to teach these techniques to students who don't have the background we thought was necessary in the old days. I do it by relying on **software packages** that can produce marvelous, complex analyses of data with a couple of keystrokes!

These are easy-to-use, but very powerful, computing platforms, and my instruction focuses on the "**objects**" of analysis (e.g., a number, a function, or a massive data set), the "**grammar**" with which to manipulate these objects, and then the **interpretation** of output from an analysis. The packages I've been using for the past 10 or so years are **free**, and I regard them as **democratizing agents**. They level the playing field so that one doesn't have to be a math major to use advanced statistical techniques, and one doesn't have to have money because the packages are free. It still **helps to have a math background** when using these techniques, so I consider myself lucky that my education 50 years ago is still useful, even if some of things I spent hours learning are now outdated.

3. This leads me to a point that my wife, **Odette**, often makes, namely, that, when we discuss what and how to teach and what to exclude, we should keep in mind that we can't know what the world will be like 20 or 50 years from now. Therefore, we should be teaching students the **problem-solving skills that can help them with future problems**, the specifics of which are unknown. I mentioned earlier that a progressive approach is to link the learning of theory to its application to a real-life problem, whenever this is feasible. This approach seems to foster **innovative thinking** by students and teachers.

A good example is the current initiative, supported by CXC, the Caribbean Science Foundation and Sagikor, to improve student achievement in **STEM** fields (Science, Technology, Engineering and Mathematics). The current societal problem they are using as a vehicle for **interdisciplinary STEM** education is "**garbage**." I don't know if it's New Amsterdam or Georgetown garbage they are examining. Either way, it's not a problem that we can be proud of, but when you're stuck with a bunch of lemons you might as well make lemonade!

4. Note that this problem-oriented approach to teaching theory applies equally well in the Humanities and Social Sciences, and here too technology can be useful, e.g., to process and visualize large amounts of relevant data. For example, an analysis of educational and economic differences among ethnic groups in Guyana might be linked to foundational studies in history, and moral and political philosophy. Students are prepared for a larger stage if, when discussing ethnic conflict in Guyana, they are exposed to general theoretical concerns, like, 'a materialist conception of history', 'the nature of equality', and 'acceptable principles of distributive justice.'

In this way they acquire general skills of **critical thinking**, and **sensitivity to the moral dimensions of human life**.

Another example might be the teaching of **financial literacy** in primary schools – ways of **inculcating the value of money**: how it is **earned, invested** in order to grow, and **donated** in order to help others. This is a critical skill for the present and future, as important as the others I've mentioned today.

5. Perhaps the most ambitious and challenging project is the Caricom goal of “embracing technology and digital literacy in all spheres.” I was talking last month to a Lecturer in Computer Science at the University of the West Indies, St. Augustine, **Andrew Rudder**, and I asked him at what age might we **teach children computer programming**. After some reflection, he said, “Six years!” He feels that the new generation of “object-oriented” programming languages are suitable for 1st-graders - these are the languages that underlie various apps for the iPad. When a child learns **basic programming skills** (e.g., ‘if-else statements’ and ‘for loops’), he or she would be learning how to **think logically, systematically, and critically**. And by the age of 10, Rudder thinks, children in such a program would be ready for a language like **Java**.

I find this idea most exciting, and I hope that enterprising partnerships can be formed to try it out immediately. We might start with:

- (a) An experimental lesson plan designed by experts, in which the basic skills are embedded in ‘games’ or ‘apps’ and other fun activities, and are presented in the context of real-world problems. The understanding should be that the plan would be revised often and in the light of evidence.
- (b) A few schools, say, 10 to 20, willing to serve as guinea pigs.
- (c) A few tutors, probably tech-savvy teenagers who can spare a couple of hours a week to tutor 1st graders, preferably inside the classroom.
- (d) A public-private agency willing to donate 1000 iPads to the children.
- (e) A committee within CXC to monitor the lesson plans and design competency tests.
- (f) A governmental commitment to support the linear build-up of the project for each new 1st grade class at the starter schools, as well as the expansion of the project to other schools as interest grows.

This last condition highlights the need for **long-term planning** if we are to provide our students with the **analytical and problem solving skills**, and the **digital literacy** they will need in a future that we cannot predict with any certainty.

6. My last example brings our focus back to teachers, specifically to the issue of **teacher compensation**. Today we can collect masses of data about teachers, the performance of the students they teach, and the families and the neighborhoods from which the students come. We can put all these data into a searchable database and crunch it effortlessly for whatever purposes we choose. A particular purpose

that has gained favor in many school districts in the USA, including all of New York state, is that of **tying teacher compensation to the performance of the students taught by the teacher.**

It is an attractive idea that teachers whose students do well should be paid more than teachers whose students do poorly. But Stanford colleagues, Linda Darling-Hammond, Ed Haertel, Xiaoxia Newton, and I examined the **fairness** of this approach, which is known as **Value-Added Modeling of teacher effectiveness.** The main input into these models is the **improvement in students' scores** during the academic year, but they also take into account the **income** of the students' families and other student characteristics, as they derive a measure of a teacher's effectiveness, the so-called '**value added**' by the teacher.

My colleagues and I found that, even with these carefully derived measures, a given teacher, who teaches disadvantaged students in a given course or year, typically receives **lower scores** than the same teacher teaching wealthy students in a different course or year. Therefore, using these scores is **unfair** to teachers serving large numbers of low-income, limited English proficient, or lower-tracked students, and, therefore, it **discourages teachers from serving in disadvantaged neighborhoods.** We support the use of value added measures as **one aspect** of a teacher's effectiveness, but our research led us to urge Education officials to **exercise caution** in using student achievement gains and value-added methods to assess teachers' effectiveness, especially when the stakes are high.

Concluding Remarks

When Leonard Lewis invited me here, he appealed directly to my strong attachment to New Amsterdam. He even described this 2-week long event as a contribution to the **redevelopment** of New Amsterdam. According to the Agenda, the topics discussed last week included **Tourism** and **Medical Outreach Programs** in the Region and, it would be good if, some time today, we can talk about the pressing **educational issues** facing this town.

From my distance in California I have had to rely on *KN*, and I couldn't help noticing that there is barely any mention of N/A there! That's my **lame excuse** for having **little to say about local issues.** I do hope, however, that some of the general ideas I've mentioned will fall on **fertile soil in the Region.** For instance, I would get a **kick out of seeing a video of a child in Little ABC** at Mission Chapel, using her **iPad to Google** "[slate and pencil](#)", the technology of her grandparents. As an exercise, she could compare the **size** and the **functionality** of the two devices, and so on. And how hip it would be if the video were shot by **another child in Little ABC** with *his* iPad!

This is just a **fanciful way** of saying that I would **love to help** in any way, here or in California, to **advance the agenda of bringing N/A's children fully and confidently into the 21st century.**

Thanks for your attention!

Acknowledgement: I wish to thank **Ms. June Welch Raphael** for her generous help in collecting relevant references in the *Kaitour News*, and **Dr. Leonard Lewis** for his suggestions about the content of this talk.