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# Learning Smart:
## Enhancing Education Through Technology


## Presented by
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By

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Master of Ceremonies,
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Distinguished Guests,
Principal,
Acting Principal,
Members of Staff,
Students,
Friends All.

Good Evening!

Let me start by expressing my thanks to the entire Shortwood Community for having invited me to deliver this the 19th renewal of the Shortwood Teachers' College Founders' Day Lecture.

I congratulate you on attaining the 123rd Anniversary of the College. Shortwood is an institution that is unmistakably one of the foundation stones of the Jamaican educational system. Having been founded in 1885, your institution has long been a beacon in early childhood teacher education, and more recently a forerunner in the use of information technology in the delivery of your curriculum. I am particularly pleased to note that classes in Information Technology are offered to all Year Groups, and that all students are given access to the Internet.

This year sees the renaming of the Lecture series in honour of past Principal Mrs Norma Darlington, who has been an architect in the intellectual and physical transformation of the College. It is fitting that the lecture series should be named in her honour, immortalizing not only her foresight in the establishment of the series, but also her astute leadership and humanity, and as someone who has touched the lives of so many in her outstanding period of stewardship at the helm of this great institution.

Let me also take the opportunity to congratulate Principal, Mrs. Elaine Foster Allen, who as we know has been appointed to serve as Chief Inspector of the National Education Inspectorate in the Ministry of Education. It is to the credit of Shortwood that it can make its CEO available to the wider country, and still have the depth of leadership and dedication reflected in the Acting Principal, Dr Chris Clarke, the Deputy Principals and other members of staff. We wish Mrs. Foster Allen great success with her new and challenging responsibilities.

## Learning Smart: Enhancing Education Through Technology

'Learning Smart: Enhancing Education Through Technology' as a topic is a useful point of departure to explore some of the emerging opportunities and new challenges of technology-assisted education in Jamaica in this, the first decade of what I have elsewhere called the digital millennium. (Dunn 2001).

As the concept of technology is at the heart of our analysis, it will be useful at this early stage to clarify the meaning and approach being taken in the use of this term.

## Interpreting Technology

Definition of the term technology is not a settled issue. McOmber (1999) delineates three meanings of technology assumed in popular discussion: technology as instrumentality, technology as industrialization and technology as novelty. He questions the accuracy of each, in a search for a more appropriate, precise and comprehensive referent. He argues that the notions of technology as instrumentality describe all the objects and practices deployed in any culture to manage its existence. While McOmber sees merit in this usage, he notes disapprovingly that this approach could lead to the idea that technology is neutral, simply performing the role of amoral tools.

The idea of technology as industrialization treats with the concept as interchangeable with modernity. He challenges this idea on the basis that technology ought not to be equated with an era (e.g. the technological age, the stone age), which undermines the existence of other and earlier periods of technological innovation. This is closely related to the concept of technology as novelty, used as a code for whatever is new. McOmber regards this usage as ahistorical. In this scenario, "new technologies forever replace old ones, continually compelling reorganization of social structures, values and priorities". According to this definition, what was once a (new) technology has been displaced, and what is technologically new will be displaced by later developments. He argues that there is a failure to acknowledge that inherent in each 'new technology' are the seeds of the previous innovations, thereby displacing technology from its historical context.

We agree with McOmber in definition of technology as cultural practice. This supports the usage employed by Bush, who regards technology as " a form of human cultural activity that applies the principles of science and mechanics to the solution of problems"(Bush, 1981). This approach emphasizes the ways in which all technologies arise, in the interest of solving problems for some person or group. There is merit in his argument in favour of maintaining a relationship between culture and technology and to avoid a unilateral view of this relationship. "From such a perspective, every dimension of the Internet, from its very existence to its overall purposes as an educational or entertainment medium, to the contents of specific web pages, is an outcome of human choices, regardless of whether choices are intentionally made". (McOmber, 1999, pp.137-153)

In this conception it is clear that societies and individuals have a wide range of technologies available to them. The scope should exist to select, adapt and apply these technologies in a manner that is relevant to each societal or to each personal need. That which may be regarded, as low technology in one part of the world may be seen as relatively high-tech in another. The implication is that each society must carefully evaluate what form of technology is appropriate to successfully deal with its human and social needs, taking into account the cultural traditions of the intended users.
The point here is that we have always sought to use some form of culturally defined or received technologies in our schools and educational system. The present era however presents us with new technology choices of an entirely different character.

Patents, intellectual property agreements and loan conditionalities can significantly reduce the level of local control and use of imported innovations. It is clear that received technology in our classrooms is not only the hardware but also the software we use in the form of operating system, the expertise for installation, servicing and control as well as the capacity for negotiation. This problem cannot be effectively tackled without a concerted effort at mastering the innovation adaptation, use and management of culturally appropriate technologies. We have to learn the ropes, so to speak, with the ultimate objective of originating a significant proportion of our own software and hardware needs. This applies as much to individual students as it does to educators, leaders of community groups, non-governmental organizations (NGOs) and government agencies.

With such an approach, the present **dominance from above** by the global technology conglomerates, multi-lateral agencies and wealthy states, can be mitigated by the creative adaptation of appropriate tools and content deployed by ordinary citizens for their own global inter-linkage, to create a potent counter-process of **globalization from below**.(Dunn, 2001)

Despite existing gross disparities in access to the emerging technologies, the largely recipient societies in the South will need to create the institutions to teach the relevant skills and to adapt all aspects of the technologies to suit our own needs. Our countries will need to address internal disparities and to begin to lay the basis for writing more of our own books, telling our own stories and originating our own online content, thereby building new indigenous resources and establishing more reliable locally based digital platforms.

**User Driven Content**

The most recent trends in communication suggest the increasing availability of informal learning and sharing opportunities via audience-centred and interactive use of emerging technologies that capture the imagination of our students. The Future of Media Report notes that:

> "The history of media has been one of passive consumption. However, today one of the strongest social trends is towards participation. There are certainly many who are largely content to be "couch potatoes", consuming the media they are given. Others – particularly younger people – are keen to create, by establishing blogs or individual spaces on sites like MySpace, or sharing photos or videos online. Even clicking on a link is a

> creative act that can impact what other [*sic*] see or don't see. Yet this is not just about a social divide. Every one of us is both a consumer and a creator. Finally today we have been given the power to create for others as well as to consume what we are given." (Future Exploration Network, 2006, p. 10)

What the report refers to is the phenomenon of the Wiki-World which takes audience participation to new limits by allowing users to create, disseminate, correct and re-purpose their own content and that of others. Good examples of this among more mature users is the 'Wiktionary', as the popular online dictionary is called, being part of Google's Wikipedia, the interactive online encyclopaedia that may itself be edited by a wide range of informed users. Such functionalities through Web 2.0 and the so-called Next Generation Networks enable both greater capacity for audience involvement and more efficient integrated use of the networks. Increasingly popular social networking sites such as Facebook, YouTube and MySpace allow users, particularly youth, to be creators, learners, teachers and consumers all at the same time. Audiences are now accessing this constantly changing content when they want, where they want, on whichever platform they choose, enabled by Web 2.0.

**User Access Technologies**

The basic technologies underpinning global connectivity and the so-called user driven wiki revolution include micro computing based on the silicon chip, satellite technology with space modules operating in both low and remote orbiting slots, digitalization - empowering integrated binary transmission of higher volumes and more varied bits of user information, wireless transmission systems such as Bluetooth, WiFi and WiMax as well as optical and laser technologies symbolised by the digital fibre optic links often used in high speed interactive communication.

The new fibre-optic and wireless applications and their interactive usages now drive the processes of **Convergence** best reflected in the Internet itself. As the network of networks, the Internet embodies advanced capacities for data processing, storage, video streaming, sound transmission, research resources, printing, narrow-casting and electronic publication. All these capacities present valuable opportunities for education and improved cultural production and distribution, while at the same time exposing societies to the risks of renewed cultural imperialism and content synchronization. In education, research and public information usages, it is crucial to

constantly remind ourselves that regardless of how advanced they are, these technologies are simply tools and optional delivery methods towards far more fundamental objectives such as learning and communicating. The technologies are means, not ends in themselves.

## The Digital Divide

Globally, we are observing a continued growth in the disparity between the so-called information-rich and the information-poor. This process is mirroring in the information age the economic disparities that have historically existed between the world's majority, who are largely from underdeveloped regions of the Global South, and the industrialised Northern countries. But this divergence in access to and use of information is also taking place within these countries, reflected in the rural-urban divide, in race and gender disparities and in social-class differentiation in terms of availability and use of information technologies (Dunn, 2006, p. 343). The exposure of poverty in the Southern United States after hurricane Katrina and more recently hurricanes Ike and Gustavo are cases in point.

In short, the emerging communications technologies are not global but, in reality, constitute a patchwork across the globe, with a still high degree of disparity in access geographically and socially. The world, after all is still not level. While some equally small developing countries such as Singapore, South Korea and Malaysia have managed to become digitally connected, a majority of others in Africa, Asia, Latin America and the Caribbean tend to be on the less advantaged side of this digital divide. For us, capitalizing on 'cultural wealth' is more of an option. Using the Internet as an example, the most recent data show that 21 per cent or about one-fifth of lower income Jamaicans, have fixed line access to these advanced technologies either at work or home (Dunn, 2007). It means that close to 80% of are still without digital broadband connectivity.

## Jamaican Education: Trends and Alternative Approaches

A study posted on the website of the Ministry of Education identifies some major challenges facing the Jamaican educational system overall:

> The educational structure is historically highly stratified and remains so in spite of policy interventions in the 1990s to reduce stratification. At the end of primary education (grade 6) students are tracked into different types of secondary schools of

> clearly different levels of quality. Children of poor families in the rural areas and the inner cities receive a low quality education that the high enrollment rates mask. It is here that the problem of school dropout in the later years of secondary education begins, with poor quality teaching and poor attendance. This particularly affects young boys. (Carlson & Quello, 2002)

The study paints a picture of a system in trouble. Although there is high enrollment up to Grade 9, there is a sharp fall off thereafter, reflecting a bottleneck in space availability, but also in levels of attainment of literacy and numeracy by students across the system, and particularly those in poor rural and inner city communities. According to the study by Beverley Carlson and Janet Quello in January 2002:

> "By far the most serious problem is students´ reading abilities. Deficient reading starts in the lower primary grades and continues to build, year-on-year. Poor reading abilities are concentrated among boys. By the time students reach grade 6, 30 percent of students read below their grade level. By grade 9 a huge divide has occurred--large numbers of students, especially boys, cannot read or write, some are functionally illiterate. Because of their reading deficiency, they cannot learn the content of various subjects. This is the tremendous paradox of Jamaican education that standard statistics do not reveal--high enrollment rates through lower secondary but low learning, interest and participation."
> (Carlson and Quello 2002)

In this report, Hyacinth Evans is quoted as saying that

> "…boys and girls enter grade 1 in equal numbers and with roughly the same kinds of experiences and skills, though we know nothing about their attitudes to school work at this age. …By the time they reached Grade 5 and 6, major distinctions were detectable in their attitude to and interest in work, the quality of work which they produced and in the academic performance...

The situation has not changed dramatically since this assessment and has been confirmed by subsequent studies and analyses. According to the **Report of the Task Force on Educational Reform** submitted in 2004, about 30 per cent of primary school leavers were illiterate and

"only about 20 per cent of secondary graduates had the requisite qualification for meaningful employment and/or entry to post-secondary programmes".

In an analysis by Minott, reported in the Gleaner of December 2005, similar problems were pointed out not only in the learning and teaching of mathematics but also of language at the secondary level in the system:

> "I believe that the English (A) or language syllabus falls rather short in providing our fourth and fifth-formers with the adequacy in communication skills required in these times."

It is clear that certain traditional approaches to education have not resulted in optimal learning. There appears to be a consensus that new and alternative approaches are required to help address the deficiencies.

Among the initiatives being undertaken to help fix the problems is more intensive use of Information Technology for lesson preparation, delivery, assignments and student research.

## Applying Technology to Education

When a decision is being made to incorporate information technology in education for the purpose of teaching, perhaps the first question that ought to be asked is 'how do individuals learn?' Understanding how people learn is critical to the process of instructional design and application of technologies in the teaching process. Among the established theories on how people learn are ideas of behaviorism, cognitivism and constructivism. Put at their most simplistic, Behaviorists maintain that knowing is the result of objective experience, the Cognitivists hold that systematic mental processing results in knowledge formation and the Constructivists suggest that knowing results from a subjective process (Lowerison, G.,Côté, R., Abrami, P.,and Lavoie, M. (2008)..

In the context of technology applications in education driven by theories on learning, each theory will yield different results. In the behavioral view of learning, the instructor using technology would transmit information to students in small chunks and provide feedback on students' responses. In the cognitivist view the teacher helps

students to encode new information while linking it with prior knowledge. **The constructivist educator however, helps students to 'scaffold' new concepts and guides students through dialogue towards knowledge seeking. Compared to other approaches to pedagogy, the constructivists approach is regarded as more student-centred as opposed to being teacher centred.**

The end result of the constructivist approach is the construction of knowledge, as distinct from students being depositories of knowledge or transmitted information. This approach is the philosophy captured by Paulo Friere when he observed that

> "Knowledge emerges only through invention and re-invention, through the restless, impatient continuing, hopeful inquiry human beings pursue in the world, with the world, and with each other." (Friere, 1993).

The writer Ignacio Estrada invited his readers to look at the issue through new eyes: "If the child can't learn the way we teach, maybe we should teach the way they learn".

The implications of the constructivist learning theory on the inclusion of technologies to improve the learning and teaching process is profound. The goal of constructivist theories of learning is to produce students who are capable of making meaning for themselves and who are able to integrate into the wider society by virtue of their education. This theory, applied to the process of 'technologizing' education, requires that the process of instructional design, pedagogy and infrastructural developments are so designed as to motivate the critical thinking dimensions of our students and to motivate within them a passion for learning.

It is this approach that informs the choice of topic for this presentation - **Learning Smart: Enhancing Education Through Technology**. It is not centered on teaching, important as that clearly is. It revolves around the idea of mediated learning, as an activity to be engaged in formally and informally by both the teacher and the student. And it seeks to interrogate the idea of how such technology assisted learning can enhance education.

## Changing Patterns – Changing Attitudes

Changing attitudes to technology in education may be demonstrated by a comment initially offered by the Washington based journal the *Chronicle of Higher Education* when the Internet was just beginning to emerge as a challenge to established sources of educational wisdom:

> "The Internet is a shallow and unreliable electronic repository of dirty pictures, inaccurate rumors, bad spelling and worse grammar, inhabited largely by people with no demonstrable social skills." *Chronicle of Higher Education.* (November 4, 1997)

Just over a decade later, the same *Chronicle of Higher Education* is now keen to declare its online reach, stating on its elaborate Internet presence that its "audited Web-site traffic is routinely more than 12 million pages a month, seen by more than one million unique visitors."

It is a change that many skeptics have undergone. Hopefully they will still retain a healthy critical attitude towards what has become widely used as trustworthy information and communication technologies (ICTs) content.

In his socio-political analyses of this developing technological and communication dispensation, Castells (2002) urges the continued adoption of an open, learning attitude.

> "Increasingly, as computer use is ever less a lifestyle option, ever more an everyday necessity, inability to use computers or find information on the web is a matter of stigma, of social exclusion; revealing not only changing social norms but also the growing centrality of computers to work, education and politics."

We need to ask ourselves whether our education system is effectively preparing its students to operate in this new framework for living learning and working.

## Formal vs Effective Access

Wilson (2006) makes a useful distinction between 'formal' and 'effective' access to ICTs. He argues that installing a cable in the vicinity of a school or community is 'formal access', while making sure that the connection results in a linked desktop for trained prospective

users would go some way in making this 'effective' access. Effective access could also be measured by the extent to which the community is represented in the related policy process (Wilson, 2006).

Many elements of Wilson's extensive narrative of 'effective access' are consistent with my own earlier call for greater national and individual adaptation and appropriation of these technologies in homes, schools and other work places and spaces, towards global inclusiveness, local control and social equity with regard to digital information flows. These measures are still seen as being among the most meaningful ways to redress important aspects of current and historical disparities:

> "The South needs to adopt the mental attitude and practical approaches which emphasize *up-loading* our own content under controlled conditions, to national, regional and global networks such as the Internet. Both in the areas of audio-visual media and text-based content services, developing countries must seek to create and sustain a *counter-flow* of information, as an alternative to the vast volumes of information flooding in from the North. The process should also involve enhancing existing levels of information exchanges in an effort to foster more education and development, using the accumulated knowledge and appropriate technologies of the historically oppressed societies." (Dunn 2001, pp 67-68)

We must not be forever seen as a society of downloaders of other people's content, other people's data and other people's stories.

## Technology Delivery Systems

The means by which popular access to the Internet and through that access to online education and e-commerce might be delivered to the general public is being hotly debated around the world. Among the contenders for platform of choice is the mobile phone, with its low cost handset and widespread dissemination. But its small screen and limited data capacity are important challenges. Mobile broadband access has its strengths but also significant weaknesses. Alternatively, the use of laptop computers has been contemplated as another route through which popular access might be achieved. The reality is that while laptops or even personal computers offer greater screen size and capacity, the cost of the hardware, the network connection expenses and domestic security in certain localities are also real challenges.

As was noted earlier, fixed line Internet access has been limited to some 21% of low income households with somewhat higher penetration rate among the middle and upper classes. On the other hand, mobile phone access now exceeds 94% among the poor, based on the TPM-DIRSI 2007 national household survey of mobile users in Jamaica. Since then, an increasing number of Internet-ready phones have been connected by providers, but with low speeds and a limited range of access to the worldwide web. The prognosis however, is that mobile broadband quality will improve as content providers and engineers design purpose-built systems and content for such systems using small screens.

In a study conducted by my research team in 2008, there was strong indication that low income users wanted to gain access to additional functionalities for a greater range of online services. Although members of the general population have shown a techno-savvy orientation in their use of affordable technologies, interest in mobile broadband is primarily targeted at immediate economic survival and social interaction. Our surveys did not pick up a strong demand for mobile phone-based educational services, but rather for banking, voting and access to government services. Screen size is likely to be a key factor in this, as it is seen as difficult to follow educational curricula from the mobile phone. But this concern could change in the future.

For a start, we have identified the mobile phone as an important transitional technology, possibly providing a starter kit for upward technological mobility on to larger and more complex broadband platforms where educational pursuits with a larger user interface would be easier.

I have argued that the mobile phone, which simultaneously conquers space and place and bridges social and economic divides may be the technology to introduce economically challenged users to the thin edge of the digital broadband domain. This is especially so for young literate users whose dexterity is required for customizing the phone and texting friends. Their phone usage will be an important primer for information literacy which could precede higher stage computing literacies. Using this bridging technology they can become keener on their information needs, able to locate information in the digital domain and able to evaluate information when the need arises. Should this avenue be pursued through strategic public policies, significant progress could be made towards cultivating a new

generation of computer users, redressing widespread digital exclusion in Jamaica and the global peripheries of the North and South.

## Mobile Education

The idea of more immediate use of the mobile phone as an educational tool should not be relegated as an unlikely or futuristic possibility. Already, there are pilot projects in the higher education sector globally using the cellphone as pedagogical tool. Stanford University, through its International Outreach Programme, undertook a pilot study called the 'Dunia Moja' project, which provides distance education in Africa through mobile phones. Stanford enlisted the support of three African universities: Makerere University in Uganda, Mweka College of African Wildlife Management in Tanzania and the University of the Western Cape in South Africa. The project also involved private sector telecoms services providers donating high-end cell phones to the programme as well as helping with the technical issues involved. Pre-recorded lectures and lecture notes were circulated through the cell phone to students who were part of the project in Africa.

Quite separately, Abilene Christian University in Texas convened an intensive collaboration between educational technology developers and academic faculty towards developing a range of mobile phone applications specially suited for their academic community. Members of their incoming freshman class of 2007 were given iPhones with educational applications which included homework alerts, in-class surveys, directions to classrooms and offices, and meal balance information.

In Jamaica, an intuitive strategy being developed by university students is to record segments of class lectures via digital mobile phones and to capture complex images or diagrams using the photo feature of the phone. These recordings are later downloaded on faster, more powerful, larger screen systems at home, in libraries or in offices for closer study and deconstruction. These low cost pro-poor initiatives, among others, hold positive implications for more widely distributed educational opportunities being made available to recipients anywhere in the world.

Illiteracy is also a critical impediment to educational broadband use on any platform. In line with the findings of the National Task Force on Education, our surveys disclosed an unusually low usage of texting among young inner city users, many of them opting for more

expensive voice communication because of the literacy skills required for writing and reading the text on the small mobile screen.

## One Laptop Per Child (OLPC)

A popular alternative to the mobile broadband options discussed above is the idea of making specially adapted, child-friendly and low lost laptops available primarily to encourage inexpensive youth adoption of computing. Although once called the US$100 laptop project, the MIT Lab's XO hardware has now exceeded that price by a significant amount. Yet, it remains a low cost educational option promoted by MIT's Negroponte and Papert as the One Laptop Per Child (OLPC) project. In 1982 Papert and Negroponte got funding from the French government to distribute Apple II microcomputers to school children in Dakar, Senegal. Papert in particular, through this project confirmed one of his main assumptions: that, "children in remote, rural, and poor regions of the world take to computers as easily and naturally as children anywhere."[1]

The OLPC concept could have profound implications on the direction of educational technology design all over the world. The XO laptop is built from free and open source software which is an approach that challenges students to modify their computers and to make them work as they desire. The idea is that over time these young children will develop a high level of cognitive interest of an educational nature, and would in all likelihood pursue post secondary academic studies.

The OLPC project has its challenges, chief of all is the financial difficulties that constrains the organizer's ability to give every child in the developing world their own laptop. There are also issues of the network interface and associated cost. In this regard, Internet Services Providers (ISPs), the Jamaican Government and educational institutions such as UWI or Shortwood could seek to partner with the OLPC project to experimentally equip children in pilot Jamaican communities with their own small laptop computer.

## Praxis: Ed Tech Delivery Experiments

Distance teaching, as operated initially by the Jamaican government's Educational Broadcasting Service (EBS) and by the UWI's early Distance Teaching Experiment (UWIDITE) were the precursors to

[1] http://laptop.org/vision/progress/

existing Internet-based delivery services such as UWI's Open Campus and the GOJ's E-Learning Jamaica Project.

While similar data in Jamaica are hard to come by, a 2007 report on online learning in the United States reported that almost 3.5 million higher education students were taking a course involving an online component in the fall 2006 term. The report further suggests that the number of online learners had increased by 9% over the previous year. This mode of delivery is gaining ground.

Jamaican educators have not been totally oblivious to these developments, and the major tertiary institutions have responded to this global trend by offering to their students online options for studying. The two main programmes devoted to online learning are UWI's Distance Education programme (UWIDEC), which currently offers over 30 courses online and UTECH's Virtual Learning Programme, which also offers over 30 courses online. These developments are still very much works in progress, and thorough evaluations of their operations and relationships with their traditional brick and mortar delivery counterparts are yet to be conducted to see what are the longer term prospects of Internet assisted educational delivery at the tertiary level.

**eLearning Jamaica**

At the secondary level, there has been a governmental effort to provide widespread access to ICTs in high schools across Jamaica through the e-Learning project. The E-Learning company of Jamaica was established in 2005 and funded by the Universal Access Fund, which itself is being funded from levies made on external telecommunications providers for calls terminated in Jamaica. The method of funding, though initially controversial, plugs a funding gap that was created by a provision in the Telecommunications Act 2000 for the establishment of a Telecommunications Access Fund. The idea now is that since we have arrived at virtual ubiquity regarding mobile voice telephony, which was the early target of the Fund, the policy goals would be re-directed to enhancing broadband access and related education.

The programme is being implemented in the grades 7-11 in some high schools in Jamaica. Its explicit aim is to enhance the teaching and learning process through the application of information and communications technologies in education. The programme covers three distinct areas:

(i) enhancing the pedagogical skills of teachers through the use of information and communications technologies;
(ii) enhancing students' learning abilities and the process of learning, using information technology; and
(iii) equipping high schools with the technical facilities and software necessary to facilitate the learning and teaching process.

While there are provisions for "enhancing the pedagogical skills of teachers through the use of information and communications technologies", a recent study of the Programme by one of my post graduate students indicated that training scarcely went beyond some exposure to technology operation, leaving little in the way of the pedagogical training. De-construction of the role of technology in education and the interface with student learner who may not have the technology at home were not being adequately addressed.

This gap is now being reflected in obstacles encountered in the roll-out of the first and still experimental pilot phase of the project. While many schools have welcomed the project as a step in the right direction, others have reported difficulties in ownership of the project within their institutions and experienced challenges in sourcing or training suitable teachers. It may have been an unwarranted assumption by the project planners that teachers in the system are either already inclined to the new technical skills, especially without explicit provision of additional financial incentives and bursaries to undertake what may be seen by some as onerous additional responsibilities.

Given the patchy school infrastructure and implementational challenges of eLearning's first phase, the still prevailing five basic components of the programme appear to be over optimistic. They are:

(a) Development of instructional materials for both teachers and students
(b) Building out the requisite infrastructure to accommodate project objectives
(c) Special teacher training programmes
(d) Support of remedial programmes through the use of ICTs
(e) Establishing a standard examination for grades 7-9 students in the e-learning programme

Using strategies of incrementalism and early stage evaluations, the planners could consider scaling back some of these immediate goals and concentrate on the first three of the five primary objectives initially. In that way, eLearning's students will be closer to experiencing the project's own declaration that: "access to data and the extensive use of data-related services are features of an educated, competitive and knowledge-based society."

Among the many other issues to contend with at this point, using the e-learning programme as an example, is the integration of eLearning theories with curriculum design and instructional methodology. Secondly, the provision of dedicated information literacy training of students would help them to cross over onto the information highway lest they are mowed down by information overloads, irrelevancies, pornography and unethical Internet usage practices now so commonplace. We will address the issue of information literacy in the next section of the paper

### *Information Literacies and Edutech*

Information literacy is an important part of the toolkit in forging greater effective access to ICTs. It may best be seen as one in a range of literacies often necessary within educational locales. Collins' useful distinction between the Universalist and situated accounts of literacy is to be valued. He suggests that the Universalist perspective on literacy views it as a "uniform set of technologies and users of language, with identifiable stages and clear consequences for culture and cognition". This approach reflects aspects of Friere's critique. The relativist's account is seen as "diverse, historically and culturally variable practices with texts." (Collins, 1995, p.75). The Universalist perspective views literacy as a "technology of the intellect" in line with Goody and Watt's main proposition that literacy helps to draw the distinction between myth and history, opinion and truth and oral culture and documented historiography.

Collins further suggests that critics of this Universalist hypothesis "have questioned the central assumption that literacy can be treated as a thing-in-itself, as an autonomous technology" (1995, p.78). Instead, these critics who argue for a more situated or relativistic viewpoint of relationship to culture, have asked whether "literacy is not essentially embedded, its nature and meaning shaped by, rather than determinate of, broad cultural-historical frameworks and specific cultural practices." (Collins, 1995, p.78).

In a recent paper authored for UNESCO, Dunn and Johnson-Brown (2007), in agreeing with this situated viewpoint of information literacies, argued that societies with even a moderate degree of technological development can leverage their own situated literacies to maximize the benefits of technologies. This analysis is crucial to the discussion on strategies for closing the educational and digital divide:

> ICT does not an information literate society make, but the technologies are enablers of multi-phase plural literacies, lifelong learning and the empowerment process. This is so because they give the user greater control over the rate at which information is consumed and understood, the time when such information is used and the power to create content. As we have seen the core principle of empowerment relies on achieving the full potential of an individual, community, and country, and in an information economy ICTs can be leveraged to achieve such an end. (Dunn and Johnson-Brown, 2007, p.21).

It is the more varied concepts of literacy and learning that may be most applicable to the cultural and economic contexts of the global South. It is these approaches that may also best contribute to challenging some of the long embedded dimensions of the historical socio-economic disparities now reflected in the current notions of the global digital and educational divide. It is not simply a technology-based digital divide but more precisely an educational divide, created, by historical and economic disparities and contemporary gaps in vision, resources and policy.

### *Educators and New Media Literacy*

The term Information Literacy encapsulates a range of other literacies: media literacy, visual literacy, digital literacy among others. But, they all point to the abilities of individuals to effectively and critically engage in what is now being called a participatory, networked culture. With those who have access being able to both create and consume digital productions, it is important to examine the vital sub-element of media literacy.

Understanding critically the agenda setting tendencies of mainstream media is a requirement of modern civic life. Beyond that is the need to also penetrate the sometimes arcane but increasingly popular 'new media' technologies, including Web 2.0 and its progeny of **wikis** and sub-networks, as avenues for enhanced consumption and creation of online content. These ideas are by no means detached from

mainstream education, and in fact, they can be potent tools if they are harnessed and leveraged to enhance current approaches to teaching and learning. In many aspects of this it is the informed or intuitive students, some just fresh from the primary educational system who will be the tutors of their more venerable teachers and parents in the use of these emerging educational and media technologies

**Media Literacy as Curriculum Component**

The Broadcasting Commission, which I have the honour to lead as Chairman, has been among many who have previously called for instituting information literacies, including media literacy, in teacher education and the school curriculum. And we are pleased that the Joint Board of Teacher Education is partnering with the Commission in a project to assist in this strategic move. This approach would train and enable teachers to guide students in processing media output and in how to use technologies and programmes that are more appropriate to particular age groups.

It is common knowledge that new media platforms like SecondLife, instant messaging services such as MSN messenger and networking locations which number over 150 sites on the Internet, are mainly dominated by the adolescent to young adult demographic grouping. Among the sites under reference are MySpace, Flixter, Netlog, Elftown, Goodread, College Tonight, Friendster, Photolog, Facebook, YouTube, Hi5, MyChurch, and many others, most counting their subscribers in the tens of million users globally. See: http://en.wikipedia.org/wiki/List_of_social_networking_websites

These user-created and youth populated sites are supported by Web 2.0, a technology which as we have noted, puts subscribers in control of content creation and global distribution. This is what motivates the high school age grouping and younger cohorts, and access persists well into adulthood. Gee (2004) has called these "affinity spaces" operating in a participatory technological culture. These spaces are really informal learning spaces, where peers relate to one another on a casual basis and new ideas are allowed to be shared freely.
Jenkins (2006) holds that affinity spaces are fertile grounds for learning as they are "sustained by common endeavors that bridge differences in age, class, race, gender, and educational level, and because people can participate in various ways according their skills and interests, because they depend on peer-to-peer teaching with each participant constantly motivated to acquire new knowledge or

refine their existing skills, and because they allow each participant to feel like an expert while tapping the expertise of others."

He further maintains that affinity spaces are distinct from formal educational systems in several ways. While formal education is often static and conservative, the informal learning within popular sites and culture is frequently experimental, dynamic and innovative. The structures that sustain informal learning are seen as more provisional, while those supporting formal education are more institutional.

**SecondLife**

Another standout example of these affinity spaces is the online virtual space called SecondLife, where people are represented by their digital representations called **avatars** engaging in real time three dimensional activities. Multiplayer educational games, such as democracy, which teaches its player about the political process and the choices encountered when governments make decisions are often in use. Real world examples of these approaches to teaching exist. For instance Jenkins reports on the approach of teachers at Byrd Middle School in the US. There, teachers asked their students to create online profiles of historical figures on MySpace as a deliberate strategy to get students to understand in a very intimate way some of these great historical characters. Teachers are thereby tapping into the interest areas of their students to add value to the learning process, and reaping better results from students in their approach to school work and how they relate to information.

***Techno-Scepticism or Techno-phobia ?***

A healthy dose of techno-scepticism is good to keep the over-exuberant techno-enthusiasts in balance. But, it also gives rise to some real hardcore legitimate negative externalities that might arise from the uncritical application of information technologies in education, issues that we cannot ignore or discount.

One fundamental concern cited by techno-sceptic Neil Postman is the idea that humanity may some day lose control of its world, to the artificial intelligences and digital systems being so enthusiastically created by those whom he regards as hapless technophiles. His concern is that we may end up with what he calls Technopoly, a state in which human capacities are obsolete as a result of the over-reliance on technologies. The argument is that when one uses a technology,

the technology is like prostheses, creating lifelong dependences which impair a return to normal human faculties.

With calculators, we can no longer do mental arithmetic, with spell-check we can no longer spell unaided. One question sometimes asked is why do we still need to cultivate these faculties if they are adequately substituted for by available technologies. We often get the answer in an electrical power outage, during a computer system breakdown or when kids ask for help with homework.

Formulations from the popular instant messaging services that many young people so love is morphing into a language and vocabulary of their own in order to facilitate the expedience of quick dialogue. For example, numbers are substituted for words, contractions are pervasive, silent consonants are omitted among other clever alterations of conventional language. For instance, in this what I call emerging 'webcabulary', the symbols "L8R" mean later; "PLS" means please; "RUOK" means 'are you ok?', and so on. The danger is that this form of communication is creeping into the formal domains of office communications and written academic work. The implications are clear.

**Technology Half Life**

Rapid dating of technologies is one of many challenges educational institutions must consider when planning for the inclusion of ICT application in their curriculum. Industry developments have largely behaved in the way that Moore's law has suggested that modern computing would. So, while high schools may be given brand new computers this year, it is a possibility that by the following year these computers and software would be outdated by IT industry standards. Technologists often refer to the rapid pace of obsolescence of hardware and software systems in terms of their half lives. This refers to the inexorable process of out-dating, updating and renewal that often render existing editions useful for only a half of their projected life-span. Most computer hardware and software have a half life of no more that 18 months, before they are superceded.

The key point here is that educational technologies should not be pursued along the line of exposing students simply to latest applications, but more especially with a view to equipping students with a sound understanding of how technologies work and how their applications can be used to solve more fundamental problems in society.

## Ethics

Another important challenge not usually confronted is the ethical use of information technologies. The need to develop school-based and lifelong deontological norms for technology usage. An area of frequent breach is inappropriate and sometimes extensive use of mobile phones, during class and at other unsuitable venues. Yet another area is the failure to observe the rules of copyright and intellectual property use in the education sector.

The ethical use of technologies should always be a critical point that is emphasized. It is not widely know that counter technological measures have already been found, at least to address some plagiarism. The 'Turnitin' and similar software devices are now being deployed to catch offenders and to determine the extent to which a students' paper is original, or whether the work is plagiarized from an Internet website or other electronic source.

The disposal of electronic waste, the frivolous use of digital cameras for capturing casual sex or to expose others are also among the unmitigated challenges of technology usage in our educational and social environments.

## Conclusions and Prognosis

Smarter learning and teaching is the indicated pathway for our engagement of information technology in education. The core ideas that have been delineated in the lecture are:

(i) The need to include of information technology in the curriculum at all levels of the education system, not as a substitute for effective personal pedagogy but as a means of enhancement.

(ii) The technologies are only tools to assist in the learning process. They must not be seen as ends in themselves. At the same time, they can allow students to understand concepts more clearly, interrogate and internalize information in a more exciting and varied manner and allow students the latitude to develop their knowledge through online research and direct contact with others.

(iii) The exponential rise in new media platforms has opened alternative avenues through which learning happens,

sometimes informally. These can be appropriated to assist in the formal learning process.

(iv) Both educators and students must become information literate including about new content delivery systems and the opportunities for further learning or experimentation.

(v) Teacher training institutions must begin to address this dimension of learning through the development of appropriate curricula and information literacy guidelines specifically targeting their teachers in training.

(vi) Blended and virtual learning environments are becoming increasingly popular in higher education institutions globally. In the blended modality, there is intermittent face-to-face contact between the tutor and students. This certainly makes for a richer and more beneficial learning experience.

(vii) The mobile phone is a widely pervasive tool and may serve as the transitional technology into more complex and advanced educational applications.

(viii) The laptop, in whatever form is also being promoted as an alternative to spread online education among the youth. The OLPC project, with its XO child computer may well be another way of ensuring a digital broadband culture among school age children and later as literate adults.

We will conclude our presentation with quotations that capture a significant part of our message. The first is the dictum of the ancient Greek philosopher Socrates (470BC-399BC) in arguing that **"Education is the kindling of a flame, not the filling of a vessel"**, a sentiment that was later made popular by William Butler Yeats in his rendition: "Education is not filling a bucket, but lighting a fire". That's the essence of learning smart, whether enhanced by emerging technologies or by our natural inspiration. In any event, we can close with the final thought, attributed to a wise Chinese peasant who reminded us as follows:

> **"Tell me and I'll forget; show me and I may remember; involve me and I'll understand."**

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