

Schooling in the Future: A South African Scenario

Jennifer Rault-Smith

Department of Education, South Africa

Abstract

The Class of 2020 entered Grade R in South Africa in 2008. They entered a schooling system that, having undergone a major transformation to reflect the political and societal changes in South Africa, is struggling to produce quality education. A key feature that suggests a positive approach to schooling in 2020 is a confidence in the National Curriculum Statement that has as its outcome a set of critical and developmental outcomes designed to produce learners who are critical thinkers, can engage with each other in a team while organizing and managing themselves effectively, can collect and analyse information and see the world as a set of related systems. It will, however, be the effective use of ICT that will restructure teacher-learner interactions and a revolutionary approach to physical infrastructure that will ensure effective use of scarce resources and allow for an individualized approach to learning in a mass education system.

Introduction

The Class of 2020 entered Grade R in South Africa in 2008. To ensure that these learners receive solid basic education and training that will give them a foundation for learning in the upper grades, in March 2008 the Minister of Education launched a Foundations for Learning Campaign. Grade R teachers in 2008 are, in fact, preparing their learners for a world in 2020 that they themselves can scarcely envisage. It is this reality of rapid change and development that leads one to ask what it is that our education system will provide over the next decade that will prepare young people for the unknown world in the future.

Schooling for the next generation in any country cannot but be determined by the past and the present. Confucius taught that you should “study the past, if you would divine the future.” In “The Go-Between”, L P Hartley remarked that “the past is a foreign country: they do things differently there” and this is, indeed, very much the case in South Africa. The country of Apartheid South Africa is a very different country from the democratic country in which South Africans now live and the future is going to be significantly affected by this transition. Advances have been made in education and training provision in the first decade of democracy. This has been driven by issues of access, redress and equity at all levels of the system and while educationists in South Africa acknowledge the need to look to the future, there is an awareness that many of the consequences of the past have not yet been rectified. At the birth of the new democracy there was an idealistic, but probably naïve, view that unification of 14 separate race-based departments of education and a new curriculum would

ensure quality education for all. Time has shown this not to be the case. In fact, national and international literacy evaluations reveal significantly low literacy and numeracy attainment rates and where education in South Africa finds itself in 20 years' time depends very strongly on whether the system is able to remedy extremely low levels of literacy and numeracy in the schools.

The class that entered Grade R in 2008 will, after one year of pre-school education and twelve years of primary and secondary education, leave school in 2020. There are a number of key questions to be addressed in attempting to suggest the scenario that would pertain when those learners complete their education. What will schooling be like by 2020? Which of the current interventions or pressures on the system are most likely to come to fruition? Will the education system meet the demands of business and industry and provide young people with the necessary skills and competencies to meet the demands of the economy? Will the battle against the violence and disciplinary problems currently evident in a small sector of schools have been won, or will all schools be war zones? Will the system retain and attract sufficient teachers to replace those who retire or who are afflicted by HIV/AIDS? Will these teachers be life-long learners who are able to keep pace with an ever-changing world, or will their knowledge, skills and competencies be outdated even as they complete their training? Will the dilemma of the language of learning and teaching be resolved?

Perhaps the most important question to ask in consideration of the future of schooling in South Africa is whether the current divide between well-resourced schools and previously disadvantaged schools can be bridged, or whether schooling will have divided itself into two separate systems? President Thabo Mbeki has spoken often of the divide between the first economy and the second economy in the country. It is a divide that is reflected in the digital world, in society, and in the education system.

In attempting to suggest a scenario that will prevail in schooling in the next decade, this article has to take cognizance of a past that has created an unnatural, and in many senses, an incomplete, present. However, the country has committed to the Millennium Development Goals and to Education for All and is working towards a future that will see the attainment of those goals with a dedication and determination that is driven by the aim of the government to provide a better life for all.

The Need for a Future Scenario

It would be unfair to describe education in South Africa at this time as being in a crisis, although there are academics who have made this assertion, Braam Fleisch's "Primary Schools in Crisis" being a case in point. Nevertheless, it is widely accepted that the ideal outcomes of an education system are not being met. It is the inability of the education system to prepare learners to play an active role in the economy of the country that is retarding the development of the country. There are, undoubtedly, pockets of excellence in the system where children and young people receive high quality opportunities for teaching and learning, but the commitment to Education for All determines that a public education system can no

longer be satisfied when it is serving only a small sector of the community well.

Schools (as Bowles and Gintis have argued) have long served as institutions of social reproduction. They replicate society and therefore societal problems. This is not a route that South Africa wishes to follow. South Africa does not wish to reproduce the current societal structures that recreate class and race stratifications that perpetuate class and race distinction and, in fact, deepen the marginalization of working class learners and children of the unemployed. Schooling in South Africa must contribute to building a new nation that respects the dignity and rights of all.

The schooling from which the Class of 2020 should emerge must recognize human rights and values but must also be more business-like and focused on delivering quality education. Schools must be more closely aligned to the organizational principles and management of the best of the corporate world. Schooling will be focused on its core business of educating the child to take his or place in a highly demanding and competitive economic sphere. A more appropriate arm of government, such as Social Development, must step into the breach to deal with the dysfunctionalities of the society from which its learners are drawn function and act as a buffer between schools and society, providing a space for schooling in South Africa to perform its core function of education. In 2020 schools must achieve greater efficiency in respect of use of time, money and human resources in an atmosphere of “ubuntu” that respects the rights and dignity of all and understands that we exist only because we engage with others. Schooling will receive young children from an effective Early Childhood Development system and must guide them through a self-lead, interactive process of learning leading to a seamless transition to higher education or the workplace. The intention of suggesting what schooling will look like in 2020 is to determine whether current trends and interventions are likely to move the system in the right direction.

Current Trends that Will Impact on Schooling of the Future

1. Low standards

Educationists battle with the tensions between raising the standard of education, including literacy and numeracy, Mathematics and Science to provide well-prepared learners for higher education, while at the same time allocating the largest proportion of resources, and giving the greatest amount of support, to schools identified as the 60% poorest schools in the country. The standard of education is generally so low that few learners in these schools are reaching the benchmarks set by national and international testing, nor are learners from these schools reaching standards required for entry into higher education.

2. Economic changes

A tight monetary policy from the late nineteen-nineties, allowed government to shed a great deal of debt, while a vastly improved tax collection system and a willingness of the population to contribute to the development of the country through taxation, saw

increased funding of education from the mid-2000's. Economic development is, however, strongly dependent on skilled labour and the country is not producing sufficient scientists and engineers to ensure the maintenance and development of both infrastructure and industry. The economy has not been able to increase the number of jobs available nor alleviate the dire poverty of the majority of citizens. Two government initiatives, Accelerated Growth Initiative in South Africa (AGISA) and Joint Initiative for Priority Skills Acquisition (JIPSA) have been instated to address the skills shortage.

3. Societal issues, including urbanization and poverty

Poverty, job seeking and the attractions of city life has led to increased migration from rural areas and the poorer, less successful provinces to the squatter camps surrounding large cities in the more economically buoyant provinces. Family life is disrupted, family support systems are disrupted living and children live in poor dwellings in unsafe conditions in cities. The demographics of schooling is skewed with large and unpredictable increases in learner numbers in the poorer areas, creating excessively large classes and putting pressure on all resources, from space in a classrooms to learning support material and the teacher.

4. Disciplinary problems and school violence

The reasons for disciplinary problems in South Africa's schools are complex and while bearing a similarity across the country, different sparks ignite the violence. Discipline has always been a cornerstone of South African education but this is no longer the case. Schools were a battleground against Apartheid from 1976 as teachers and learners stood together against the government of the time and in many schools today, teachers who themselves were not subject to disciplined behaviour, do not impose discipline on the learners. The South African Schools Act of 1996 does not permit corporal punishment in any form whatsoever. Many teachers bitterly resent this curbing of the only form of discipline that they have in their repertoire. Very few teachers have developed more appropriate and effective methods of disciplining young people, resulting in a situation where there are no processes to keep learners in check. As crime and disregard for societal norms has risen, so the disciplinary problems in schools have grown. In other spheres of society, children experience a much more liberal approach to child rearing resulting equally in poor discipline in schools. The majority of schools experience disciplinary problems, but a small percentage also experience problems of violence – violence between learners, between learners and teachers, and even between community members and learners on or near the school grounds, with a devastating impact on education in those schools.

5. Population trends

Population growth in South Africa has increased apace. The Community Survey conducted by Statistics South Africa in 2007 revealed an 8% increase in the population

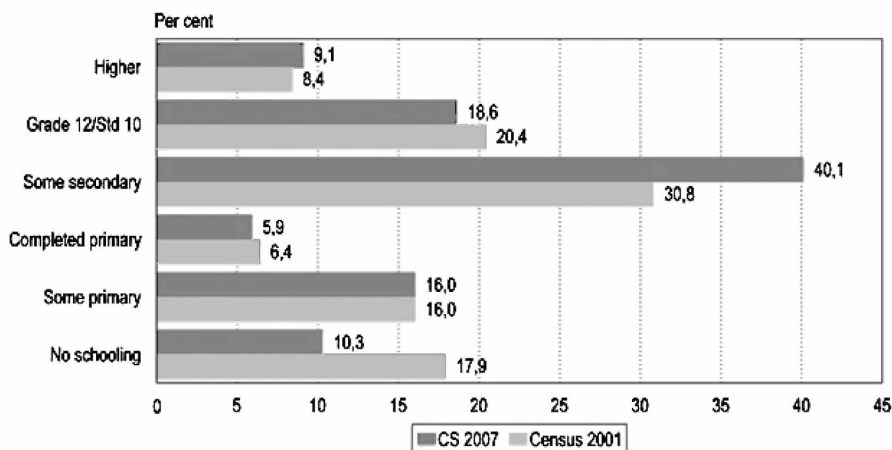
over a period of five to six years, despite the prevalence of HIV/AIDS (See Table 1). This is a decrease of 2.2 percent on the population increase from 1996 to 2001 but even at a decrease of 2.2% over 6 years, there would still be positive growth in the population by 2020. Both the population growth rate and the increasing percentage of the population that has acquired a secondary school education suggests that numbers in schools will not have declined by 2020 (See Figure 1).

The Department of Education statistics in respect of the numbers of learners in schools show that the intention to offer universal Grade R education to all five year-old children is

Table 1. Population Trends

Provinces	Census 1996	Census 2001	% Change	CS 2007	% Change
Eastern Cape	6 147 244	6 278 651	2.1	6 527 747	4.0
Free State	2 633 504	2 706 775	2.8	2 773 059	2.4
Gauteng	7 624 893	9 178 873	20.4	10 451 713	13.9
KwaZulu-Natal	8 572 302	9 584 129	11.8	10 259 230	7.0
Limpopo	4 576 133	4 995 534	9.2	5 238 286	4.9
Mpumalanga	3 124 203	3 365 885	7.7	3 643 435	8.2
Northern Cape	1 011 864	991 919	-2.0	1 058 060	6.7
North West	2 936 554	3 193 676	8.8	3 271 948	2.5
Western Cape	3 956 875	4 524 335	14.3	5 278 585	16.7
South Africa	40 583 573	44 819 778	10.4	48 502 063	8.2

Figure 1. Trends in Educational Qualifications



succeeding (See Table 2). By 2020 all five year-olds will be in school. This will add an additional half a million learners to the primary system by 2020 and will double the demand for primary school teachers. The table also shows an increase in the number of learners remaining in school until Grade 12. Whether these figures continue to increase will depend on whether the education system can engage the interest of learners.

Table 2. Learner Enrolment in Schools

Grades	2002	2006
Gr R	278 726	441 587
Gr 1	1 286 591	1 185 198
Gr 2	1 012 892	1 081 652
Gr 3	949 721	1 099 319
Gr 4	1 076 107	1 072 780
Gr 5	1 142 806	1 026 031
Gr 6	1 038 679	919 487
Gr 7	958 932	872 051
Primary	7 465 728	7 698 105
Gr 8	936 392	1 020 734
Gr 9	1 089 404	970 946
Gr 10	876 175	1 093 297
Gr 11	719 952	890 564
Gr 12	486 786	568 664
Secondary	4 108 709	4 544 205
Total	11 853 163	12 242 310

The National Curriculum Statement

The apartheid system of schooling that provided only limited educational opportunities for black learners, in line with the jobs that were considered suitable for black people, has left deep scars. One of the deepest scars is the vacuum in respect of adults trained and competent in Mathematics and Science as it was not considered appropriate to include Mathematics and Science in the curriculum for African children. It therefore goes without saying that Mathematics and Science will feature strongly in education in 2020, even though there is likely to be a shortage of Mathematics and Science teachers.

As may be expected, the adoption of a new curriculum for all learners was a priority for the Department of Education in 1996. The new curriculum provided a break from the past and ensured a single curriculum for all children by providing not content, but outcomes to be attained. The shift was, however, too dramatic a revision and the curriculum was strengthened and streamlined, but did not change, even before all grades had made the change.

Although the National Curriculum Statement faced significant resistance in the implementation phase, even after the strengthening and streamlining of the curriculum, it is highly likely that it is the curriculum that will prove to be a strength of the education system by 2020. The curriculum is not a content-based model and therefore does not rely on

memorizing a core of knowledge beyond that knowledge that allows for effective development of knowledge and skills. The curriculum is constructivist in nature and intends that learners know and understand how to think critically and how to create, find and to develop knowledge. Implementation of the curriculum, which was finalised in 2008, should see the Class of 2020 emerging from a system in which the implementation of the curriculum will have reached maturity.

Perhaps key to successful teaching and learning for 2020 are the Critical Outcomes and the Developmental Outcomes (See Figure 2). These 12 outcomes are those that all learners should attain via their engagement with the 8 Learning Areas in the General Education and Training Band and the 7 subjects that they must offer in the final three years of Further Education and Training. These Outcomes will provide learners with the competencies necessary to engage with knowledge and with the level skills necessary for industry and higher education and training in an Information Age that will have reached maturity. If the learners in the class of 2020 have been taught according to the curriculum, they will have acquired the twelve critical and developmental outcomes that underpin the curriculum and describe the kind of citizen that should emerge from the schooling system. The critical outcomes include core life skills for learners, such as communication, critical thinking, activity and information management, group and community work. The developmental outcomes focus on enabling learners to learn effectively and become responsible, sensitive and productive citizens. Indeed, the National Curriculum Statement describes the envisaged learner as “a lifelong learner who is confident, literate, numerate, multi-skilled, compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen.” By 2020 schooling should equip young people with these key skills and competencies.

Figure 2. Critical and Developmental Outcomes

The Critical and Developmental Outcomes envisage learners who will be able to:

1. Identify and solve problems and make decisions using critical and creative thinking.
2. Work effectively with others as members of a team, group, organisation and community.
3. Organise and manage themselves and their activities responsibly and effectively.
4. Collect, analyse, organise and critically evaluate information.
5. Communicate effectively using visual, symbolic and/or language skills in various modes.
6. Use science and technology effectively and critically, showing responsibility towards the environment and the health of others.
7. Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

The developmental outcomes envisage learners who are also able to:

8. Reflect on and explore a variety of strategies to learn more effectively.
9. Participate as responsible citizens in the life of local, national and global communities.
10. Be culturally and aesthetically sensitive across a range of social contexts.
11. Explore education and career opportunities.
12. Develop entrepreneurial opportunities.

General Education and Training

Adherence to the National Curriculum Statement will ensure that the language and culture of all of South Africa's citizens is respected and schools will be multi-lingual, with all learners offering at least three of South Africa's official languages.

By 2020 teacher uncertainty, inadequate content knowledge of teachers and a lack of resources will have been addressed and it can be expected that the majority of learners will attain the learning outcomes expected by the curriculum by the end of the General Education and Training Band, i.e. Grade 9. The school of 2020 will look to its own context and environment to determine the languages and subject matter to be addressed in attaining the required learning outcomes. Learners will begin their learning by understanding their context, while schools, which will be dependent on expertise that they will have to "buy in", will have expertise close at hand.

Literacy and numeracy will remain key pillars of the General Education and Training programme and achievement in literacy and numeracy will be at an acceptable international norm as a result of the concerted efforts of the Minister of Education in 2008 to harness widespread support to improve literacy and numeracy. The enhancement of teacher skills, provision of appropriate resources and the monitoring of progress via regular assessment will have assured this improvement.

The need for stability in the education system suggests that it is highly unlikely that the curriculum in the General Education & Training Band would be significantly different in 2010. However, the Information Communication and Technology aspect of teaching and learning will undoubtedly be enhanced and teaching methodology is likely to change significantly. Assuming that current initiatives to make broadband access available to schools have been successful, much of the teaching will be electronic, providing opportunities for a much more individualized approach to teaching and learning. Teachers will be provided with appropriate software to track learners' progress and to adapt the curriculum for individual learners.

Life Orientation will be considered a key Learning Area as the Convention on the Rights of the Child, to which South Africa is a signatory, states that: The purpose of education is to foster development of the child's personality, talent, and mental and physical abilities to their fullest potential to prepare him or her for responsible life in a free society, in the spirit of understanding, peace, tolerance, equality of the sexes, and friendship among all peoples. This will be the General Education and Training Band teacher's core function. Teachers will focus on the development of values in line with the curriculum and constitution while supporting the development of knowledge and skills and guiding learners, particularly in respect of appropriate subject selection for future careers.

Further Education and Training

The National Curriculum Statement for Grades 10 to 12 prepares learners for entrance to higher education or for the workplace. This curriculum is committed to a dynamic approach to new knowledge and skills. The curriculum was introduced at Grade 12 level in 2008 with a commitment to gradually raising the bar in respect of the range and level of knowledge, skills and competencies required. Nevertheless, it is in the curriculum for Grades 10 to 12 that the greatest changes will be observed in 2020 as this subject-specific, knowledge-based curriculum attempts to meet the demands of higher education and the job market.

Even as South Africa moves more fully into the Information Age, the focus will still be largely on skills required in the Industrial Age. This is a result of the enormous backlog in infrastructure in a country where the twentieth century saw the majority of the population living in rural areas with no infrastructure. The urbanization of the late 20th century and the early 21st century has created an overload on the infrastructure. In January 2008, saw the parastatal electricity supply commission, Eskom, announced that it had insufficient power to meet the demands of the country and that “load shedding” would be implemented across the country, leaving large areas of the country without power for several hours a week. Lack of expertise, particularly electrical engineers, was a major cause of the inability of Eskom to deal with increased demands for power. This suggests that not only will Further Education and Training Colleges focus strongly on technical skills, schools too will have to respond to the demand for young people with a technical education. In a country where in 2008, 27% - 40% of work seekers are unemployed, schools cannot but prepare young people for the jobs that are available.

Nevertheless, in 2020 schooling at the Further Education and Training level would have adopted a multi-faceted approach directed at the full spectrum of skill levels to ensure technological change rather than merely additions to labour or capital will be the main driver of economic growth and an improvement in the quality of human capital. Key to this quality is competency in literacy, mathematics and science. It is for this reason that mathematics or mathematical literacy will remain pivotal to the school curriculum in 2020.

Currently there is strong resistance to preparing learners too early for a specific vocational pathway but the need to supply skilled labour has driven the Further Education and Training Colleges to become very selective about the subjects and courses that they offer and the learners who may select particular courses. With only 16% of school leavers entering university, and half the adult population on social welfare, this is an approach that will be evident even in secondary schools in 2020. There will be greater control over the subjects that schools offer and such offerings will be closely linked to the needs of local industry and the probability of a programme of learning leading to employment. Even learners wishing to enter university will have to align their proposed university course with economic or professional needs of the country.

Teachers

The Deputy Minister of Education noted in a speech in 2005 that “in Africa as a whole, there is a shortage of teachers. Children are in large classes and, according to a report in News from Africa, more than 40 million African children receive no schooling. This constitutes almost half the school-age child population. If we are to achieve the Education for All goals of getting all children in Africa into school and provide them with quality education by 2015, Africa will need an additional 1,36 million teachers.”

More than a decade ago, UNESCO forecast that Africa needed to expand its teaching force at a rate of 5.6 % per annum during the 1990s but recent research by UNESCO has shown that the teaching force has grown at only 3.4 per cent over the past fifteen years, slightly ahead of the growth in the number of children in school, but not at the rate needed to provide enough teachers for education for all.

The supply and quality of teachers will undoubtedly drive much of the change that will take place in schools over the next decade or two. In a country where, for the first time in a formally educated society, intelligent and competent young people, men and women, have free choice in career selection, few of the best are selecting teaching as a career. Teaching has, more so than ever, become a career for those who cannot make the grade elsewhere. Even the best recruitment strategy is unlikely to ensure that there are sufficient teachers to meet the needs of schools as they are currently organised. This shortage of qualified teachers will put pressure on the current organization of schools where one highly qualified teacher can only offer education to a single class of 30 to 40 learners at a time and no more than five to six classes in a day. Scarce teacher resources will be particularly evident in the Foundation Phase (Grades R, 1, 2 and 3), Languages, Mathematics and Science.

Highly qualified scarce resources will have to be used more effectively. It is likely that the shortage will have been resolved by looking both to the high levels of unemployment in the country and to effective use of Information Communications and Technology. Teacher assistants, who have lower qualifications than fully-fledged teachers, will become a common feature in classrooms. Their job will be of a tutorial nature, providing guidance and support to learners and also assisting with classroom management. ICT solutions will enable teachers to present lessons to more than one class at a time, even in different schools, while the assistant teachers manage the classrooms and deal with learner tasks and assessment. ICT will enable learners to receive individualized online instruction.

Policies cannot resolve the issue of the language of instruction. The tension between ensuring one’s child learns in his or her mother tongue and thereby develops the competency to think conceptually and to gain a deeper sense of culture must be balanced against the reality that even in 2020, English will be the lingua franca in the country, and certainly the language of higher education and business. 2020 will undoubtedly also see a shortage of young teachers who are mother tongue speakers in African languages trained to teach primary school classes. It can therefore be assumed that by 2020 efforts will have been made to enhance the quality of mother tongue teaching, again using IT to provide more individualized

learning, but that the language of teaching and learning in the vast majority of classes will be English.

Electronic management of learners and their work will allow teachers to escape from the pressures of crowd control and allow them to focus on the task that drew them into teaching in the first place – developing the knowledge and skills of young people. Every teacher and every learner will be provided with a laptop. Electronic management of learner work will allow teachers to set work appropriate to each learner and to engage more fully with the learner in respect of his or her work than is possible in the limited time available in the current classroom-based engagement with learners. Having a one-on-one engagement with an individual learner will no longer put the rest of the class into dead time.

Because every teacher and learner will have a laptop, teaching and learning support material will likewise be individualized. The notion that the entire class group will learn best from a single textbook will be dispelled and learners will, as is currently the case in higher education, receive a list of references to be consulted, including websites. This individualization of learning support material will be facilitated by e-books, a system that will absolve schools of the high costs of printed material and the burdensome task of selecting, ordering and managing large sets of material that is rapidly out of date, resulting in repeated expenditure on such material. The administrative task, currently performed so unsuccessfully in so many schools, of managing an inventory of material that is often not returned at the end of the year, will be a thing of the past.

The Western Cape Education Department Khanya Project has undertaken extensive work in the field of e-Education, as has the Gauteng online project of the Gauteng Department of Education. At least two of the leading independent schools in South Africa are leading the way in electronic contact and support for learners. The e-Education White Paper of 2005 has seen increasing numbers of teachers acquiring qualifications in IT and by 2020 every teacher will be IT literate.

Inclusive Education

In 2001 the Department of Education released the White Paper on Inclusive Education which would provide appropriate support for learners at all schools so that learners who experience barriers to learning need not be confined to “special schools” but would be able to attend the school of their choice. This position was given impetus when in November 2007, South Africa signed the United Nations Convention on the Rights of Persons with Disabilities. Article 24 of the Convention provides a guarantee that persons with disabilities will not be excluded from the general education system on the basis of disability, and that children with disabilities are not excluded from free and compulsory primary education, or from secondary education, on the basis of disability. The intention is that persons with disabilities should have the right to access an inclusive, high quality and free primary education and secondary education on an equal basis with others in the communities in which they live. The impact of the White Paper and the United Nations Convention will have a significant

impact on schooling in South Africa by 2020. It will be commonplace to see schools that are integrated not only in respect of race, but also in respect of physical abilities/disabilities and other barriers to learning. Teachers will not feel disempowered when faced by the learning barrier of a child but will be able to access a comprehensive support package either online or from people in the district with the required expertise. Individualised learning programmes will allow children to require tuition at an appropriate level while learning to function in an integrated environment. A range of government departments working in the school will offer additional care and support for learners. Infrastructure for schooling will provide disability-friendly environmental access for learners with physical disabilities so that no child is excluded from the school of his or her choice by 2020.

Organisation of Schooling

Jay Ogilvy of the Global Business Network argues that schools bear the “scars of their birth in the agricultural and industrial eras.” The institutionalized arrangements of schooling have not changed since the time during which schooling became universal in industrialized countries. Education is certainly one of the few areas in which there has been no real organizational change, probably because public education is not driven by market forces, but supported directly by public funding.

In suggesting a scenario for the future, the question to be addressed is whether the country will look to re-invent schooling or whether a conservative approach will prevail. Schooling will have to deal with the tensions of more centralized and tightly monitored systems as pressure on the education system to produce young people with the necessary skills is increased.

It is inevitable that by 2020 schools will have become more business-like. Schools will have managers who will deal with management of the facilities, finances and staffing while an academic principal will take responsibility for the academic programme.

The eEducation white paper is intended to drive education in South Africa towards a largely ICT dependent approach to education. This approach has stalled on the back of the lack of broadband connectivity. The optimistic scenario is that ICT matters, including the provision of broadband connectivity will be resolved by 2020. The demand for good interconnectivity with the global world should ensure that business finds the means to ensure connectivity, thereby providing education with the necessary platform.

The concept of gathering a largely disparate group of learners who live in a neighbourhood in a building, dividing them into groups of 30 to 40, and teaching 30-40 individuals a set of knowledge determined by an official in a government office does not seem a realistic option for the future. Secondary schools will not be organized around the current concept of classes. Schools will become places in which learning takes place, not where teachers determine what learners must learn according to prescribed timeframes. Secondary schools will no longer be time-driven. The day will not be divided into 30 to 40 minute slots. Lessons will be determined according to the work to be presented, the concept

to be discussed or the practical application of knowledge. Lessons may take place in classrooms, via electronic teaching or individual tuition. Schools will have broadband connectivity, mostly wireless, which will allow learners to work on their personal computers individually, in learning groups, or in the media room.

More individualized learning is inevitable while, at the same time, highly qualified scarce resources will have to be used more effectively. Working with learners on individual learning programmes will be a key function of teachers who will be responsible for guiding the learners' programme of learning that will lead them to attaining the critical and development outcomes, learning outcomes and assessment standards. Learners will be independently responsible for their own learning while teachers will be responsible for monitoring their learning programmes and providing core teaching. Much of the individualization will be made possible by the use of a smart chip to track attendance, work and other activities as well as the progress and development of learners. As learners will be responsible for using appropriate resource material, a school will be centred around a library or media room. Virtual schooling will be a reality for learners in rural areas and for those in urban schools where there is a shortage of teachers in particular subjects.

Infrastructure and Resources

The physical school building will be a thing of the past for those learners who choose to be educated entirely online, although generally online learning will take place at schools for specific subjects only and be part of an individualized learning solution.

Schooling in 2020 will take place in a purpose built center of learning. In 2020 new buildings will inherently resolve the issues of physical safety and individualized learning. Schooling will take place in buildings that will more closely resemble a mall than blocks of square rooms with long corridors. Buildings will be child- or adolescent and disability-friendly and engender in young people a desire to engage in learning activities with a sense of anticipation and excitement. The fablab in the Department of Science and Technology innovation centers in various South African cities provides the facilities and resources for people to design and create innovative technologies. This concept will be common to forward-looking schools by 2020.

The current notion that a single class group will move through the learning process together and using the same teaching and learning styles will no longer hold. Therefore, key to physical infrastructure will be the provision of facilities to enable learners to access information and knowledge. This will include a comprehensive media center with library books and web access and a range of places in which learners can learn, explore and research.

Key to the success of schooling in 2020 will be an environment that accommodates the full range of teaching and learning styles. It will be an environment that allows teachers and learners to work theoretically and to engage in practical application of the theory as required by the curriculum. Model new schooling infrastructure will include lecture theatres to facilitate large group teaching and learning experiences, tutorial rooms to provide facilities

for small group activities, structured learning and to give learners the opportunity to work in collaboration with others, while individual learning spaces will be provided in a range of formal and informal settings. Facilities in the schooling infrastructure will not be the sole domain of the learners at that school. Schools will be much more public places, providing a broad range of facilities for the use of the community and for learners from other schools. This could include a library for learners but also catering for pre-school children and adults engaged in recreational reading or life-long learning. It may include a performing arts theatre, language laboratories, a radio station, meeting rooms, boardrooms and museums

Every building will be ecologically sound, making use of passive heating, solar and wind power, and environmentally friendly building material. Ecosystems appropriate to the environment will be developed to facilitate environmental studies and natural science. The infrastructure will consider needs of the community and provide a one-stop service for the access of government services from registering the birth of a child online to collecting a pension from the ATMs in the school. A mini-mall would include a food court, banking hall, post office, retail store and other experiences that would prepare learners as future consumers and provide amenities to the community.

Most important of all, schooling would be free for all in respect of access and cost.

Conclusion

The above scenario cannot be an official view of the Department of Education as there are too many conflicting possibilities to take a position in respect of schooling in 2020, especially as the enormous changes experienced in South Africa recently does not provide a stable basis on which to build future scenarios. The scenario is based on key insights and lessons learned whilst working in the current educational environment but, while educational officials can have a particular view of the future of education, political shifts, changes in an economy that is closely linked to the global economy, or even seemingly insignificant factors can take schooling in a completely different direction. It is in the exercise of considering future scenarios that the value lies, not necessarily in the scenario presented.

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