

Microsoft® Europe, Middle East and Africa

Education Solutions Group

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The Business of Schools: African Pathfinder Blueprint



Forward

In the new global economy, Information Communications Technology (ICT) will become ever more important as an enabler for learning, growth, employability, and social inclusion. It is vital that Governments across the world effectively harness the power of ICT and help all citizens realise their potential. It all starts with our schools. "Today's students are tomorrow's business leaders." Providing essential ICT literacy and more importantly leveraging ICT as a tool for learning should be key goals for all schools.

This is why Microsoft® has spent the last two years testing an ICT Blueprint for Schools in Namibia, which we call the African Pathfinder. Built upon 20 years of experience in the business of schools, we believe this Blueprint highlights the critical components that all schools need to consider for a successful ICT implementation strategy.

Microsoft, through our global Partners in Learning programme, continues to be committed to Education and helping all students from across the world realise their potential through the power of ICT.



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Introduction



Nelson Mandela and Kofi Annan
Secretary-General, United Nations

Microsoft believes that through effective partnership, we can help to improve and accelerate education and learning, create new opportunities for employability, strengthen local communities, and help all citizens realise their potential. Further, we believe that traditional barriers to digital inclusion such as poverty, age, disability, geographical location, and lack of education can be broken down through effective use of ICT and public/private partnership. This ICT Blueprint for Schools is part of the long standing commitment by Microsoft to Education: a tried and tested methodology for the successful integration of ICT into the curriculum and the business of schools.

"Education is the great engine of personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mineworker, can become the head of the mine, that the child of farm workers can become the president of a great nation," Nelson Mandela.

"The single most important use of information technology is to improve Education," Bill Gates.

"If the world is serious about achieving the Millennium Development Goal of halving the number of people living in extreme poverty by the year 2015, ICT must figure prominently in the effort. Everyone – governments, civil society, private sector businesses – has a vital stake in fostering digital opportunity and putting ICT at the service of development," Kofi Annan.

Information and Communications Technology (ICT) is a powerful tool that can help individuals, communities, and nations realise their potential. It may be used by people and governments as a tool for sharing information, knowledge and skills, making it possible for young people and adults to learn and think in new ways. It helps businesses and nations increase productivity, promoting economic opportunity and higher standards of living. It is a tool for innovation, helping creative minds around the world develop new products and services, explore uncharted territory and solve problems in ways never before imagined. But millions of people are prevented from accessing ICT resources and skills that will pave the way for a more prosperous future by economic, geographic, and social barriers.

UN Secretary General Kofi Annan has issued a call to action¹: an invitation for Public-Private Partnerships to build greater digital inclusion and a sustainable information society for all. At Microsoft we support that aspiration: our comprehensive commitment is to broaden digital inclusion and bring the benefits of technology to a quarter of a billion people by 2010. We have extensive experience in providing ICT skills, education, sustainable IT solutions, and curriculums that can help address the diverse array of needs found in countries developing their strategies around ICT. We believe that the most effective way of tackling big challenges such as these is through the creation of multi-stakeholder partnerships with governments, NGOs, civil society, and local communities in which companies such as Microsoft act as key stakeholder, leading enabler, and strategic supporter. Sharing this Blueprint for Schools is just one example of our commitment to supporting the UN's call for action.

¹ Message of Secretary-General for World Telecommunications Day, 17 May 2005



At Microsoft we believe education is the foundation upon which change is made, communities are formed and people are able to achieve their goals.

At Microsoft we believe education is the foundation upon which change is made, communities are formed, and people are able to achieve their goals. When talking to national leaders we find a common theme around their wish to create diverse economies based on knowledge and with a global reach. In many countries if the children of today grow up to reflect the economy of today, then these dreams will never be realised. The wish is to create doctors, engineers, scientists, technologists, entrepreneurs, lawyers, accountants, publishers, and the vast range of specialists who are needed to accelerate economic development.

If developing countries are to achieve this rather than produce another generation of subsistence farmers they will need efficient, diverse, and flexible learning programmes. Not just to address basic literacy but providing access to specialist knowledge and learning infrastructures. They will require interventions that help overcome the shortages of qualified teachers. They will need to be part of communities that can share knowledge on a local, regional, and global scale. They must be able to change, update, and restructure their learning delivery to reflect the speed of the world around them. For success the business of the world economy must be reflected in the business of schools.

The Microsoft Blueprint for Schools is a comprehensive model for the holistic integration of ICTs into national educational strategies. It is based on the nine critical components we consider essential for the "business of schools": Leadership; Policy; Research; Access; Innovative Solutions; Curriculum; Training; Communities and Partners; and Support. It is an efficient, scalable, affordable, and sustainable model for ICT capacity building in education through increased access to and use of ICTs in schools. A one-size-fits-all approach rarely works so critically the Blueprint is designed to be flexible, supporting and building upon existing ICT and educational policies and strategies.

The Blueprint explains what is required and why. It is focused on countries starting to put ICT within their schools and provides real world examples of its successful use in Africa and beyond. By sharing our Blueprint with others we wish to build partnerships with Governments and key stakeholders to help realise peoples' potential, not only as our contribution to digital inclusion but also providing an engine for a country's economic growth through developing skills for the 21st century. We believe this will lead to the creation of economic inclusion through employment, Small Medium Enterprise (SME) development, and in turn support the eradication of poverty.

Many of the examples come from Namibia where the Blueprint was trialled during a two year partnership between the Parliament of Namibia and Microsoft. Known as the African Pathfinder, the goal was to thoroughly test the Blueprint in a real situation: supporting moves by the country's public school system toward the establishment of a national ICT strategy. Working alongside a multitude of stakeholders from government, the education community and business partners, we developed existing initiatives, identified needs and priorities, trialled new technologies and reference models, and implemented practical technology solutions to the conditions we found on the ground. Learning from this process, we adapted and further developed the Blueprint, creating a model that is capable of replication in all countries wanting to successfully integrate ICT into all of their schools.

The need for ICT in Education



Microsoft, and others, believe that the use of ICT and the teaching of ICT must be integrated into national education strategies. ICT supports the development of a modern workforce, dependant on ICT for skills such as communication, collaboration, and research. ICT allows for accelerated delivery of education to help address global challenges such as the UN Millennium Development Goals. These challenges require the innovative interventions that ICT can provide: i.e. to address shortages in teachers, make learning more inclusive and fun for all, provide the flexibility of delivery for addressing inequalities such as gender, language, and disability, allowing teachers to focus on teaching and improve efficiency of management. In short ICT supports and accelerates the business of schools.

"One of the Millennium Development Goals is achievement of universal primary education by 2015. We must ensure that ICT is used to help unlock the door to education, whether for young girls in Afghanistan, university students in Uganda, or workers in Brazil, so that they can fully seize economic opportunities, and live lives of dignity, free from want," Kofi Annan.

"ICTs can provide a practical and enabling solution for improving the quality and quantity of education. The advent of highly responsive networks of information and knowledge, the rapid development of smart software hardware, and the channels of communication have presented a real opportunity to creatively solve deficiencies within the educational systems around the world," United Nations ICT Task Force.

"No developing country can afford to ignore the impact of the 'digital divide' as it divides the 'haves' from 'have-nots'. Those that do not have the opportunity to access or develop ICT skills are increasingly excluded from the knowledge economy, jobs, and government processes, leaving them disempowered," Mr Mosibudi Mangena, South African Minister of Science and Technology.

On starting in his new office the UK Prime Minister Tony Blair announced that his three priorities were education, education, and education. He and his government have for many years invested in the belief that "The future lies in the marriage of education and technology"² as a critical factor in realising their vision for education and their country. This is a view repeated by leaders across the globe. The reason is easy to articulate: education gives knowledge and empowerment so powering economic and personal development. However, implementing this is much more difficult than saying it!

Nowhere is this more evident than in the United Nations eight Millennium Development Goals (MDGs)³ the second of which aims to achieve universal primary education. Many people also believe that most if not all of the other goals to improve health, combat HIV/AIDS, and ensure environmental sustainability are dependent on education. Only through efficient education delivery programmes will it be possible to achieve all the goals and eradicate poverty and disease e.g. health education, environmental education, awareness of gender equality.

² Tony Blair 1995

³ See <http://www.un.org/millenniumgoals/>

The MDG challenge is greatest in sub-Saharan Africa. The UN report "Progress towards the Millennium Development Goals, 1990-2005"⁴, highlights some of the issues: Net enrolment rates of 62.2% for primary education, 52.8% primary school completion, and 74% literacy rate amongst 15-24-year-olds. The report concludes "Achieving the goal of universal primary education will require dramatically scaled-up efforts in sub-Saharan Africa, Southern Asia, and Oceania. In these regions and elsewhere, increased enrolment needs to be accompanied by efforts to ensure that all children – especially those hardest to reach – remain in school and receive a high-quality education. School enrolment and attendance can be improved by reducing or eliminating school fees, providing school lunches, improving the quality of teaching, and bringing schooling closer to home." Against this requirement the report comments on the impact of AIDS on teaching. It says "the epidemic is expected to significantly contribute to future shortages of primary teachers. Without long-term planning, it will be extremely difficult for these countries to meet their school enrolment targets." If achieved there still remains the goals of providing universal access to secondary and tertiary education!

It is in this environment that education leaders are looking to ICT to help with addressing the shortfall in teachers and other resources through supporting in-service teachers to deliver more efficiently, and preparing pre-service teachers for a learning environment that must reach further and higher education. This is because to achieve economic growth primary schooling will not be enough. While trying to address these basic needs there is a bigger change taking place in education that is changing the focus to delivering learner centred education and developing students in the very skills the global ICT revolution has promoted.

The World Bank believes that today's networked world demands a workforce that understands how to use technology as a tool to increase productivity and creativity. Essential skills include the ability to identify and assess information and communicate it to colleagues, collaborate across regional boundaries, cultures, and languages; and work in flexible, changing environments. Does any country believe they can create such a workforce without integrating ICT into the education systems, or does any country believe they can avoid the need for such skills by finding alternative means for economic growth?

Within an education system ICT can be used in many ways. At its simplest, ICT can be used to teach ICT curriculums. ICT can be used to release scarce teacher time through automation of teachers work, e.g. simple marking, communication. ICT makes it easier, quicker, and cheaper for teachers to form communities that share knowledge and best practice, for example through sharing lesson plans rather than reinventing them. ICT provides a richer set of materials for lesson plans such as animations of scientific processes that enrich both the teachers and learners experience, as well as to convey concepts more easily. ICT allows for rapid dissemination of content, be it education ministry notices, upgrades to curriculums, and digital textbooks.

⁴ http://unstats.un.org/unsd/mi/goals_2005/goal_2.pdf

The need for ICT in Education continued

The use of ICT allows greater focus on the task being learnt rather than performing the mechanics required to learn it. For example, when investigating mathematical functions visually, rather than spend most of the lesson drawing a graph, spreadsheets allow instant visualisation, so leaving greater time to experiment. ICT allows rapid feedback of monitoring data so underperforming teachers, schools, or students can be identified earlier such that remedial measures can be implemented sooner. Good software can provide affordable access to content simulations of experiments that would not be possible for financial or safety reasons. ICT will never replace good teachers but it will transform their role, allowing them to move away from the blackboard and to focus their attention on smaller groups and individuals. ICT provides mechanisms for delivering distance and self managed learning, increasing access to education. ICT supports individualised learning.

But in regions where schools often have only the most basic of equipment and a shortage of teachers, the value of ICT in the classroom goes far beyond that of a practical teaching aid. ICT implemented in schools can be leveraged to help the wider community, providing a greater return on the initial investment. The community can, in turn, help to fund the installation and running costs of the equipment. Used in this way, ICT can provide innovative and flexible training for teachers and deliver educational and literacy programmes specifically targeted to adults in the local community. It can be used to foster sustainable development and economic growth at local community level by supporting the development of a wider knowledge economy. It can increase the access of rural care-givers to specialist support and remote diagnosis and connect citizens with government services. And it can connect small businesses with their customers, reduce business transaction costs, increase market coverage, and improve competitiveness even across borders. The Global e-Schools and Communities Initiative states that the benefits ICT brings include access to an increasing number of vital services that are or can be made available online. These include information about weather, agricultural prices, various government services, health, bill payments, and online purchasing of goods.

We can see that ICT is needed to help deliver Millennium development goals, to jump beyond this stage to produce a workforce with the skills for a world of business where ICT is critical, as a tool to support the business of schools, and as part of a wider digital inclusion of the community.



ICT can provide innovative and flexible training for teachers and deliver educational and literacy programmes specifically targeted to adults in the local community.

A Blueprint for successfully implementing ICT in Schools

"A well-educated and skilled society leads to improved development through healthcare, nutrition, and economic performance. By working together, the Namibian Parliament and Microsoft have begun an important process of equipping today's students, who are tomorrow's leaders, with the resources and skills that will pave the way for a more prosperous future. I believe I speak for every Member of Parliament in saying I am very proud of the success of the African Pathfinder initiative and confident in the potential it has to empower the people of Namibia," Theo-Ben Gurirab, Speaker of the Parliament of Namibia and former prime minister.

"Because technology has become increasingly important in education, teachers want to work at schools where technology is available, so better-funded schools are luring the best teachers away from rural schools because of their richer teaching environment. Pathfinder removes this incentive for teachers to relocate," Namupa Nengola, American Federation of Teachers Project Manager for the Namibian Education Technology Alliance.

"We recognise the importance of harnessing ICT to help improve sustainable livelihoods in underserved communities. By working with global business leaders such as Microsoft that support our efforts to establish open and inclusive knowledge societies, we can accelerate the creation of social change and the expansion of economic opportunities throughout the developing world," Koichiro Matsuura, UNESCO's director general.

Until recently no single study has provided a step by step guide that would enable governments to identify all the necessary elements of a comprehensive e-strategy that would enable them to create an educational ICT infrastructure in a scalable and sustainable manner. To address this, and drawing on a broad field of expertise, Microsoft developed this Blueprint for Schools to guide e-strategy development, and based it on the nine critical components we consider are essential for success.

The Blueprint is designed to be flexible and adaptable to national, regional, and local needs and priorities. One or two of the components can be implemented in support of existing or planned education and ICT strategies. But we recommend all nine elements are implemented as a holistic, scaleable, and sustainable ICT strategy.

A Blueprint for successfully implementing ICT in Schools continued

- 1. Leadership** at all levels is needed. No government will have the resources and knowledge to plan, fund, implement, and control every element of implementing ICT in the education system. Governments need to establish a Schools Leadership Forum involving key stakeholders, with a range of expertise to support the creation, planning, and delivery of the policy from both public and private sectors.
- 2. Policy** adoption is critical to success. All schools require a Government supported ICT policy plan appropriate to the nation's resources and capacity. This ICT in schools policy sets out the plan, goals, and milestones. It is the route-map for schools to align with and follow.
- 3. Research** that assesses, quantifies, and evaluates the impact of ICT investment on the education community and which feeds back into the planning process.
- 4. Access** to a reliable power source, the Internet, affordable computer hardware and the latest PC technology, local content, and quality software that promotes both social and economic inclusion.
- 5. Innovative solutions** capable of incorporating ICT into the educational process and giving students, teachers, and parents the tools they need to ensure effective instruction and optimal student performance and that has a positive impact in managing the business of schools.
- 6. Curriculum** that matches the needs and priorities of the local education community.
- 7. Training** in teacher training colleges and in schools using ICT based education delivery systems for experienced and non-experienced teachers. This includes both the ICT literacy components and the professional development of teachers in the effective use of ICT in the curriculum.
- 8. Communities and Partners** will enable the sharing of best practice, testing ICT solutions, and connecting like minded groups of people through dynamic learning communities that bridge the divide between borders, cultures, and languages.
- 9. Support** services should be deployed that are both affordable and effective, and meet the needs, staff and students within the school.

Microsoft looked for a partner in Africa which was also looking to implement a national ICT in education strategy. Namibia has a history of using ICT in education and has a leadership with a vision about how they wanted to use IT to transform their country. The Pathfinder partnership was created between Microsoft and Namibia to look at a holistic national project based around testing the new Blueprint with a focus on developing previously disadvantaged schools. The Pathfinder team, with membership from Parliament, government, and the country's education community worked closely to test the Blueprint to address Namibia's needs and priorities. It supported the government's existing ICT policy and planning. Throughout the process the lessons learned were fed back to ensure the Blueprint's robustness, its long term sustainability, and its scalability across the country and across the continent.

The nine critical components for a successful ICT Blueprint for Schools



A Blueprint for successfully implementing ICT in Schools continued

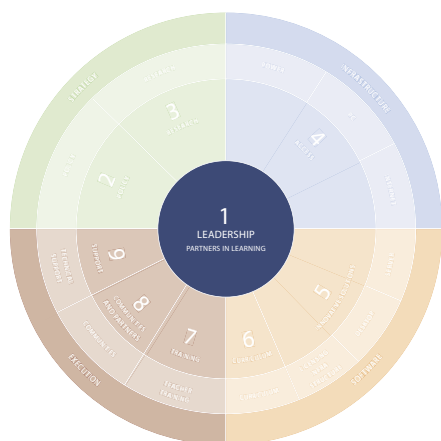
This initiative is now locally owned, operated, and managed by the Namibian government. The Ministry of Education has developed it further and is deploying larger 31 seat computer facilities in its schools. These facilities are funded and specified by the Ministry, use the Pathfinder refurbishment centre to source their computers, use the locally developed partners to install and provide support, use the teacher training resources created under the Pathfinder to prepare teachers receiving computers. This work has already overtaken the initial Pathfinder in terms of scale of deployment and the Ministry plan to continue this programme for a number of years to come.

Beyond Namibia the Pathfinder work and its component products and programmes are being shared and are used widely across the continent and beyond. Microsoft has agreements with 15 countries in Africa that use components from the Pathfinder. The Blueprint is being used by countries starting to implement ICT into their school systems. The success of Pathfinder goes in conjunction with the Namibian government's vision and determination for development, and underscores the value that technology can bring to students, teachers, and administrators for countries developing their use of ICT in schools.



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Leadership



Private public partnerships are key to successful, scalable, and sustainable deployment and support across entire countries. Government led Leadership Forums with stakeholders from the education community, private sector, and central and regional government are essential in the building of an inclusive and sustainable ICT plans for schools.

"In order for ICT to positively foster [UN] development goals, it must be employed where relevant, appropriate, and effective cross-sector complexities and issues must be overcome... to create an enabling environment for innovation and to prioritise a focus on investment and development uses of ICT. Specifically, full demonstration of development impact; integration and prioritisation within national development and poverty reduction programmes and strategies; policy realignment on basic infrastructure deployment; improved government and donor coordination and cooperation; increased private sector engagement; and, enhanced mechanisms for resource mobilisation," UN Information and Communication Technologies (ICT) Task Force Third annual report to the Economic and Social Council (ECOSOC).

"The Information and Knowledge Society and Economy require the involvement of all stakeholders in the formulation and implementation of policies and strategies. For many of our countries this entails a balanced composition of government, private sector (both local and international), academia, civil society, as well as international development agencies," Ms. Lalla Ben Barka, Deputy Executive Secretary, Economic Commission for Africa (ECA).

"A ministry of education cannot take on the task of equipping schools alone. It is simply too big a job. Governments will need to form strategic partnerships if they are to succeed," Ten Lessons for ICT and Education in the Developing World, Robert J. Hawkins, World Links for Development Programme, The World Bank Institute.

Countries face many obstacles and challenges in the implementation of national educational e-strategies: primary teacher supply and effectiveness; acute teacher shortages in some secondary subject areas; digital inclusion issues; reforming education for the knowledge (global) economy and leveraging Public Private Partnerships to list a few. No single actor has the vision, power, and resources needed to effect a strategy to address these factors.

Through the Microsoft Partners in Learning initiative Microsoft has learnt that Leadership Forums that include stakeholders both from public and private sector are critical for providing the inclusive support essential for delivering an integrated national strategy. Microsoft has worked with governments across Europe, the Middle East and Africa to set up Leadership Forums bringing together a wide range of stakeholders from government, development agencies, international financing institutions, donors, research bodies, consumers, and the private sector. Together these stakeholders, many of whom will be non-specialists both in education and in ICT, bring their expertise and experience to play. This provides tangible support for governments defining and implementing their national e-strategies for education.

Leadership continued



The UNICT Task Force recommends the establishment of innovative public-private or multi-stakeholder partnerships between government, business, civil society, and international organisations for large-scale ICT for Development projects, building ownership, ensuring relevance, leveraging core complementary competencies, and sharing financial risk. For many countries Public Private Partnership is a relatively new concept. Whilst many leaders recognise the value of engaging with and getting the support of the private sector, there are difficulties around implementation. Government staff often lack the legal frameworks and guidelines around how to engage. Issues of culture, transparency, decision making mechanisms, and success measures need addressing at the highest level to ensure successful coordination in the field.

Stakeholders, if made part of the policy team at an early stage, will buy into and support the strategy delivering crucial elements such as electrical power, digital content, technical support, telecommunications, distribution, financing, training, legislation etc. The specific nature of a country's goals means that customised pioneering solutions will often be needed, for example, to create a PC purchase scheme for teachers and students. The private sector will play a critical role in developing, building, and deploying the necessary infrastructure and services. They will be required to provide tailored educational solutions developed through years of investment in R&D and innovation. Where national capacity is sparse or concentrated only in a few locations then partnering with the private sector partner allows the creation of support networks both for education and business, so providing economies of scale and drivers of quality, as well as supporting local economic development and capacity building. By securing their commitment to best value through win-win relationships, the total cost of the strategy will be reduced.

Kenya Leadership Forum

The ICT Trust Fund of Kenya was formed in the month of February 2004 between the private sector and the public sector with the aim of spearheading the ICT Initiatives in the Education Sector. Its overall objective is to facilitate Public Private Partnerships (PPP) to mobilise and provide Information and Communication Technology (ICT) resources to Kenyan public schools.

It is chaired by the Permanent Secretary of the Kenyan education ministry. Membership is from a wide range of organisations including Kenya Airports Authority, Barclays Bank of Kenya, Telkom Kenya Limited, Microsoft East Africa Software Limited, Kenya Electricity Generating Company Limited, Communications Commission of Kenya, Kenya Revenue Authority, Kenya Airways Limited, Kenya Ports Authority.

Check list of possible organisations involved in a Leadership Forum

- Ministry of Education – overall leadership, curriculum development, teacher training.
- Ministry of Finance – funding and finance regulations including tax regime for equipment e.g. if imported.
- Ministry of Works, or private building contractors – preparation of school rooms (power, security).
- Power company – provision of electrical power including linking to planned schools deployment plan.
- Telecommunication company – provision of Internet, satellite links etc.
- Bank – providing funding opportunities e.g. loans for schools or teachers to purchase computers.
- Media Organisations – to promote the work and build broad community awareness and inclusion.
- Publishers – creation of digital content.
- ICT Companies – provision of tailored solutions (software, hardware, configuration, installation, support)
- Higher Education Institutions – pre-service teacher training, skills for higher education.
- Major Employers – skills required / shortages, resources needed.
- NGOs and funding agencies working in the field - coordination.

Policy



E-strategies and policies are critical in order to communicate clearly the rationale for using ICT in education, the national priorities, resources required, roles and responsibilities for delivery. Without this, work is often unsustainable and can result in unnecessary, one-sided ICT-driven programmes, often undertaken without proper evaluation.

"Higher education, ICT diffusion, and R&D capacity will not develop overnight, and it is important for developing countries to start systematic efforts in creating such capability with a longer-term perspective and vision," European Bank of Reconstruction and Development.

"The socioeconomic impact of the knowledge and information revolution derived from Information and Communications Technology (ICT) has been compared to the industrial revolution, providing nations and individuals alike an unprecedented opportunity to accelerate economic growth, promote human development, and eradicate poverty. But without innovative ICT policies, many people in developing countries – especially the poor – will be left behind," United Nations Development Programme.

Studies by the G8 Digital Opportunity Task Force⁵, the United Nations Commission on Science and Technology for Development⁶, and others conclude that the potential of ICTs to contribute to development depends largely upon the formation of national and regional e-strategies and policies. Organisations such as the World Bank are committed to the development of e-Learning policies, encouraging the public sector to take a lead in improving access, and aggressively promoting ICT in schools to diversify the educational experience and encourage cross-cultural communications between regions and nations.

Without a policy to provide the rationale for implementing ICT in schools it is impossible to understand how best to implement. Each country will have different vision that defines what they are doing. However, the visions often follow a number of themes. For example, the Commonwealth has identified four such themes⁷: to build a resource of people highly skilled in the use of ICT in order to strengthen the economy; to create a cadre of students capable of competing in the global knowledge economy; to enhance the delivery of the curriculum through the use of ICTs; to redefine the curriculum in order to reflect the changing economic and social needs of the country, focusing on skills of communication and information; reasoning and redefining the role of the teacher.

⁵ "Digital Opportunities for All: Meeting the Challenges – Final Report of Digital Opportunity Task Force", G8 Summit 2001

⁶ "Third annual report of the Information and Communication Technologies Task Force", United nations, 6 June 2005

⁷ Applying New Technologies and Cost-Effective Delivery Systems in Basic Education, UNESCO, April 2000

Until recently the use of ICT in schools has lacked clear government guidance, but this is changing. Governments and their partners are increasingly moving away from having multiple, uncoordinated education pilots, to delivering a joined up single national project. Historically, implementing ICT in schools has often been just applying technology on top of traditional teaching methods, or simply putting PCs into schools. This Blueprint advocates e-policies developed by a consortia of stakeholders working in Leadership Forums, that place the emphasis on identifying critical prerequisites to support national visions and their implementation. They include such things as: workforce skills; standards for interoperability; regulatory frameworks; improved access to infrastructure such as telecoms and power; the promotion of innovation and creativity; and a favourable investment climate.

E-Strategies for schools do not sit in a vacuum but must be linked to other government policies and long term plans including the wider educational policy to ensure coordination and integration around issues like social access, linguistic diversity, gender, and HIV/AIDS awareness, just to mention a few.

Namibia ICT in Education Policy

The Namibian Government recently finished developing their Strategy for ICT in Education. The document lays out their goals around workforce development and the wish to improve education delivery through the use of ICT. It makes clear the priorities for allocating resources, which put teacher training top of the list. It says what services must be put in place to deliver the policy. It shows how the policy links to the national ICT policy, and covers its relationship to national priorities such as AIDS and gender equality. The document makes clear how governance decision making will be achieved.

Research



Research is necessary to provide the information and knowledge/ideas needed for planning implementation, and then to provide feedback on progress made, and finally as a means to evaluate success. Without such research you will not know what is possible, what is credible, what is failing, and what the value of your work is.

"Over the past decade, many countries have spent significant time, energy, and resources to design e-strategies which often remained blue prints, or white elephants because no systematic set of indicators had been agreed upon and established to monitor and evaluate their implementation," The World Bank E-Strategies Monitoring And Evaluation Toolkit, January 2005.

"Monitoring and evaluation are important components of project planning and management. Monitoring is the process of gathering and analysing information while activities are taking place in order to make the project more effective. Monitoring should take place on a continuing basis. Evaluation is the process of determining the worth of a project and deciding whether to continue it or start up a new one. Evaluation can occur periodically: not only at the end of a project," Benefits of ICT for community development through non-formal education, UNESCO Bangkok.

The World Bank recommends that monitoring and evaluation of the impact of ICT should be a vital part of strategy design and implementation, and a condition of its effectiveness⁸. Strategies should be explicit and realistic with regard to what they aim to achieve, and their implementation should be regularly assessed and realigned to ensure the efficient use of scarce resources.

Research is critical in deciding how best to build ICT into a curriculum. Given limited resources there is a need to select priorities for its use. Educational data is required to identify which areas of a curriculum are working well, and which areas are not working so well and could benefit from an ICT intervention to help improve their delivery. At a higher level in defining the overall national curriculum a similar process is required to research trends in needs for long term workforce skills that are underpinned by ICT, and so require ICT based interventions in the national curriculum to teach them e.g. the need for a workforce that can collaborate and communicate globally.

Research is required to establish the baseline from which you must build upon e.g. the number of computers already in schools, the number of teachers with ICT qualifications. This research enables policy makers to produce an implementation plan which is practical and feasible for the resources available. It provides the basis upon which policy decisions can be made in an informed manner, and coordinated implementation planned.

While implementing it is important to research the impact of what you have done so far. This ensures both problems and evidence of success are spotted as soon as possible. For example research in the UK found that around 80% of teachers felt use of ICT had helped reduce their workload⁹. Such information is valuable in deciding the scale of impact and informing decisions such as whether to try to continue investing.

⁸ The World Bank, E-Strategies Monitoring And Evaluation Toolkit, January 2005

⁹ The Stationery Office - Survey of ICT in Schools 2003

Measurement and evaluation of the impact of ICT investment should reflect the fact that ICT is only a tool and not an end in itself. An increase in the number of telephone lines, personal computers, or Internet hosts available in the country is not the most appropriate way to assess whether or not an education policy has been successful. On the other hand, while the economic and social value that people will derive from a greater use of ICTs is clearly a much better indicator of such success, it is also much more complex to measure, monitor, and evaluate. For example, in the UK research found a statistically positive association between pupil ICT use and national tests for English (at Key Stage 2), and a statistically significant positive association between pupil ICT use and national tests for science (at Key Stage 3). While this indicates ICT is probably helping the national English and Science programmes it can not show whether in fact ICT use does improve English or Science outcomes. UNESCO is clear that indicators are needed to show the relationships between technology use and educational reforms, the empowerment of teachers, changes in teaching and learning processes, and student learning. Still more difficult to measure is the impact of ICT in promoting creativity, empowerment, and equality and producing efficient learners and problem solvers.

Research goes beyond understanding what you have achieved; it also encompasses what you might achieve. It is important for education leaders in ministries to understand what other countries are achieving so they can benchmark their own country. They must also have ways to learn about new technology opportunities and research their benefits. Creating regional centres of excellence focusing on implementing ICT in schools help this process.

Pathfinder Research

As part of the African Pathfinder, research was conducted on a number of levels. The simplest was collecting data from training session feedback forms, and helpdesk queries. This provided some immediate short term feedback on the effectiveness of the implementation of IT in the schools and allowed managers to identify problems and provide readily available solutions. We also partnered with organisations such as the American Federation of Teachers who were investigating the use of IT in English, Maths, and Science teaching in Namibia. Their research provided an independent insight into the impact of the Pathfinder PC labs on educational targets.

Finally we contracted an educational researcher to conduct research into Pathfinder's impact in schools. This ranged from phone interviews to on-site research visits. Initial feedback has already highlighted a number of surprising findings and has highlighted benefits that were not envisaged during the planning stages of Pathfinder. These include the high value placed by teachers on access to digital educational content. Used as a replacement for existing, and often out of date textbooks these provided rich and original content for lessons and its interactive element engaged and stimulated the children.

"During training the Namibian teachers were really excited by Encarta, the multimedia encyclopaedia, immediately seeing new opportunities from using it in their work and with their students," Baldev Singh, Namibian teacher trainer, ICT teacher at John Cabot CTC in Bristol and DFES Innovative Teacher of the year 2004.

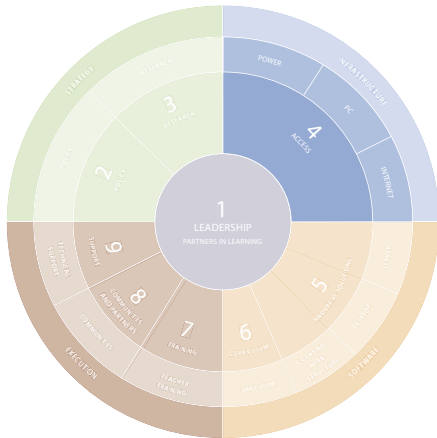
Research continued

School Technology Innovation Centres

As part of the Microsoft global citizenship programme, Partners in Learning, and in cooperation with local education authorities, Microsoft is creating School Technology Innovation Centres throughout Europe, the Middle East and Africa. They are testing the latest technologies and content solutions for schools. The centres help educators and educational policymakers realise the potential of ICT in teaching and learning by giving first hand experience of what is possible.

The first centre, opened in Jordan, February 2005, under the patronage of Minister of Education HE Dr Khaled Toukan, is a result of a long-term collaboration with corporate partners Hewlett-Packard, Cisco Systems Inc, and Intel Corp. It serves as a demonstration and learning laboratory for educational institutions in the region and will share innovative teaching practices and provide information, training, and equipment for teachers to enhance their use of ICT in their classrooms and curriculums.

Access



Access to the physical infrastructure of ICT required for a national implementation in schools is prohibitive for many countries. The use of flexible, innovative solutions can increase access to ICT infrastructure and services. Re-use of quality PCs can provide significant savings and still provide access to the latest technologies. Solutions such as broadcast satellite and off-grid power can provide access to the remotest areas. Providing 80% functionality for 20% of the cost makes nationwide implementation possible for many countries.

"We will connect every village, every school and every clinic in Africa; if we are determined enough to do this," Thabo Mbeki (then South Africa's Deputy President) closing the AFRICA TELECOM 98 forum in Cape Town in May 1998.

"We are now starting to use refurbished computers from Digital Pipeline in our schools, as we feel that including refurbishes into our model will reduce the cost of implementing ICT in schools, allowing the Ministry to do more with less," Johan van Wyck, Deputy Director – Information Technology, Namibian Ministry of Basic Education, Sport and Culture.

In 2003, at the first World Summit on the Information Society, a commitment was made by the world community to provide half the world's population, four billion people, with access to ICT by 2015. This is no easy task, and the challenges for countries trying to enlarge their ICT infrastructure and reach this target are immense. Access to the Internet is possible for just 1% of population of Sub Saharan Africa¹⁰. In Uganda, just 3% have access to electricity whilst in rural South Africa over 16,000 schools are without power¹¹. For many people the cost of a new PC is prohibitive, representing over a year's income. For many countries the cost of acquiring new PCs to put into all their schools would use up most of their education budget. These immense barriers have meant that for many countries attempts to introduce ICT into schools have been uneven. They are often addressed in piecemeal fashion and projects rarely move beyond the pilot stage since they failed to implement a solution that can be scaled up nationally. Often countries lack a nationwide infrastructure for power and telecommunications upon which an education e-strategy can be implemented. In these rural places the challenge is to bring power and communications as well as effecting change by introducing ICT into the schools. Innovative alternatives are required if the use of ICT in schools is to be a reality for all, rather than just a few.

This Blueprint has approached the problem from an 80:20 perspective. If 80% of the functionality of a first class system can be created, but at around 20% of the cost of a first class system, then progress is possible.

¹⁰ World Bank

¹¹ Solar Electric Light Fund, Inc.



This requires hard choices when looking at cost versus function. Nowhere more than with telecommunications and Internet access. In Sub-Saharan Africa there are just 15 fixed-line telephones and 37 mobile phones per 1,000 people¹² and the cost of their sustained use is beyond the budgets of many educational establishments. While fixed or cable-based network solutions may be the most appropriate solution for areas with high population-densities, the cost is prohibitive. For rural areas even if such solutions were affordable, they are not available. In this respect, wireless and satellite-based solutions offer a promising alternative. Both offer economic efficiencies over traditional fixed-line solutions, and they are robust with large footprints and fast rollout periods that cut the cost of increasing network capability. Such solutions offer long-term cost advantages because they scale effectively across multiple sites allowing digital content production and update costs to be shared widely. By adopting broadcast satellite, costs can be reduced by an order of magnitude for dissemination of digital data such as Government notices to teachers, textbook updates, anti-virus updates, and shared knowledge e.g. lesson plans, all in near real time. The lower volumes of returning data from teachers, such as student records, can be sent on digital media through the post. While not providing the full Internet type functionality of a school in somewhere like London, they can provide much of it and a very much reduced cost i.e. 80% of the function for 20% of the price.

Acquiring PC hardware requires similar solutions. In the lowest income countries a PC costs more than the average annual output per person: Mali has a GNI per capita of around U.S. \$300¹³ whilst a new PC costs around U.S. \$500 without networks and peripherals. Meanwhile, Gartner Group estimates that in 2004 150 million PCs were replaced. This end of use hardware that can often offer many years of useful capability that otherwise often ends up in landfill sites. PC refurbishment programmes such as the Digital Pipeline are now available that provide reliable access to hardware in a sustainable and scalable way, and at less than a quarter of the cost of a new PC. By providing a total solution for donor and recipient these costs may be further reduced by mutual benefit. Quality and a sustainable supply are essential when using refurbished PCs, as is the development of qualified local partners in a country that can deploy them using optimised models like the Pathfinder schools used.

The unreliable access to power in many parts of Africa, requires pioneering solutions to provide off-grid electricity supplies. Work is just starting on using solar power for rural schools¹⁴. Solar power often provides more 'even' electrical supplies to computers in distance locations that suffer from fluctuating power supplies. However the economics of large scale solar provision have yet to be demonstrated as being scalable. Until this is resolved close coordination through Leadership Forums with power company infrastructure planning is essential to coordinate deployment.

¹² World Bank

¹³ World Development Indicators

¹⁴ <http://www.digital-links.org/whatwedo/creativesolutions.htm>

National Computer Refurbishment Centre in Windhoek

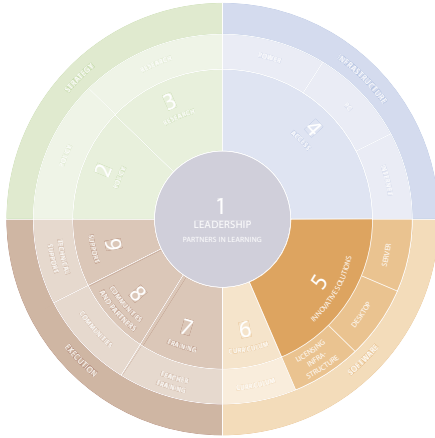
Microsoft and the Namibian parliament have created a model for extending the value of refurbished PCs, reducing the costs for schools and other organisations that need computers whilst ensuring a sustainable supply. The National Computer Refurbishment Center, located in the Windhoek Vocational Training Centre, prepares PCs sent from Europe and elsewhere for use within schools, NGOs, and community centres across the country. The centre is also host to an IT Training Academy and the combination of facilities provided the country with its first vocational PC technician course that is helping build national computer support capacity and providing work experience. Microsoft is now assisting other countries to develop similar centres.

A Solution for Schools

During Pathfinder, thirteen schools in Namibia had computer facilities installed using refurbished PCs, with satellite receivers and using mains power. A complete facility had a dozen PCs, as well as a wireless network, Uninterruptible Power Supply, server, and cost under U.S. \$5000 including setup. The satellite service was provided by WorldSpace and allowed files placed on a central computers to be automatically sent to all the schools. Innovative software solutions provided access to the latest software and digital content such as Microsoft Office XP Professional and Microsoft Encarta® encyclopaedia even though students were sitting at 3-year-old refurbished computers.

Building on this experience, solutions with 31 refurbished PC's are now being successfully deployed in Namibian schools by the Ministry of Education.

Innovative Solutions



Innovative solutions using advanced software provide the opportunity to redefine approaches to learning, increase resources available to teachers and students, improved access to learning, reduce teacher workloads, improve communication and management, and create communities of knowledge sharers. Care must be taken to ensure interoperability through the use of standards and well integrated solutions.

"With an increasing number of different learning platforms now in use in compulsory education, the wide adoption of a standard, consistent, and technically robust method of exchanging learning content packages between systems is essential to the future growth and success of ICT in education," British Educational Communications and Technology Agency.

"Not only has Microsoft enabled us to utilise our first computer laboratory through this programme but through Microsoft software we are also able to give our students the same experience as students in Western Europe," Mr. Damaseb, Headmaster at Eden Primary School, Namibia.

Innovative software solutions are the glue that holds the ICT systems together, enabling individuals to take full advantage of the digital revolution. They push the boundaries of what is possible. They improve academic computing, facilitate e-learning, and streamline administrative processes, giving students, teachers, and parents the tools they need to ensure effective instruction and optimal student performance. In short they support the business of schools.

The capabilities of, and advantages inferred by, innovative software solutions shape e-policy making in many ways because they dictate what the policy can achieve. They influence how PCs are deployed into schools, the efficiency of ICT, teaching and its management, the breadth and content of the curriculum, who can access education and how.

Innovative software solutions provide education authorities with a controllable infrastructure that can be customised to meet their requirements and a flexible learning environment in which resources can be easily deployed. They can be deployed to reduce total cost of ICT ownership, enabling institutions to quickly and efficiently configure computer labs, install their software on the desktop and build a network. The network can run innovative software designed to reduce the complexity involved in its management, so reducing support and training costs. For example, computer hard drives are a significant source of failure. The ability to deploy a diskless refurbished PC that boots from a CD-ROM or network server removes this risk and extends the life of PCs as well as reducing maintenance costs.

Innovation must include approaches to support and management. Governments need to consider how they address intellectual property rights around innovative solutions and should be looking for complete offerings that give them easy management, clear upgrade paths, and legal protection as well as access to identified levels of support should they face problems. National Schools' agreements can provide for these needs.

ICT-enabled solutions also present significant opportunities for enhancing the efficiency and effectiveness of education administration. Through the use of ICT data repositories and networks, curriculums can be developed collaboratively, educational materials can be procured cost effectively, and teachers can raise standards by spending less time on paperwork and more time on teaching. For example, research in the UK found that around 80% of teachers felt use of ICT had helped reduce their workload¹⁵. Innovative solutions now make it possible to create learning content and tests to accompany it. To then share it automatically across schools and once submitted returned by to pupils to have it marked immediately. Results can be returned to a central location for evaluation proving real time feedback on national performance in the subject.

In many countries, the curriculum is constrained by the tools available to the teachers. Innovative solutions can break those barriers. They can provide a cost-effective alternative to traditional teaching methods replacing, for example, costly science laboratories with learning programmes that offer simulated experimentation in an interactive and safe environment. They provide access to wide range of Internet-based educational services, alternative materials, and curriculum resources to download and use in the classroom and they help to develop the basic skills and attitudes that make up a positive, problem-solving, entrepreneurial mindset: lateral thinking, questioning, independent and self-reliance. They broaden the range of educational opportunities available to students providing them with the skills and knowledge they will need to serve as productive members of the global knowledge economy. You will never have a beating human heart or nuclear reactor in a classroom but pioneering software solutions can provide an experience similar to having them, but with safety, and in a cost effective way.

Many countries wish to help students to access and use information and communications applications such as e-mail, calendars, and discussion boards, but are concerned about privacy and safety. By selecting integrated solutions education ministries can provide a secure framework for communication and collaboration across schools and regional boundaries.

Innovate solutions can be deployed reaching students outside the traditional education system: those that, through gender, distance or disability, are unable to physically attend school. Self-paced ICT learning solutions are often most appropriate for those children who have their education disrupted and are unable to keep pace with the traditional system, or for adults who have been unable to access schooling, or wish to further develop their skills. By selecting solutions with innovations for disabled learners greater inclusion and integration of the students is possible. The needs of such students should be remembered when writing tender specifications for software solutions, as should the use of specifying open standards to insure interoperability e.g. using SCORM for e-learning tenders.

¹⁵ The Stationery Office - Survey of ICT in Schools 2003



William H. Gates
Chairman and Chief Software Architect
Microsoft Corporation

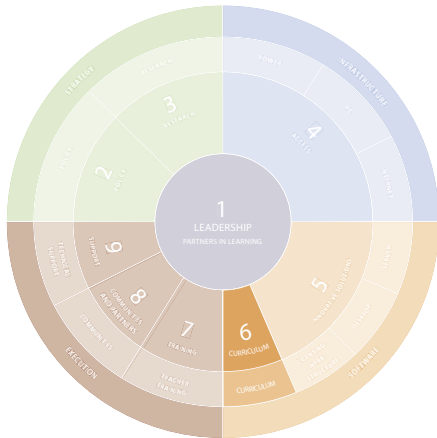
Learning Network Manager

Microsoft created a tailored schools solution during the Pathfinder. Using in the field feedback from it's initial development and trials in Pathfinder schools, it is now being launched as a full Microsoft product to assist schools in deploying and maintaining their ICT infrastructure. It allows a teacher to automatically setup a PC, and provides tools to manage students and staff using the schools computer facilities. It will automatically install and configure packages like Microsoft Learning Suite that give software for students and teachers to create newsletters and slide shows, produce maps, provide a digital library etc. Learning network manager has tools that allow the easy use of refurbished PCs or new PCs. Support for people with disabilities, and the ability to customise and link to schools management systems is built in.

The Digital Library

Access to up-to-date, engaging, technical books to support science lessons is challenging for many Namibian schools. The Pathfinder schools had the opportunity to test the use of digital content through using Microsoft multimedia encyclopaedia Encarta. Not only is it continually updated but it provided colour images, animations, and three dimensional tours. It proved to be very popular not just with students, but also with teachers preparing lesson plans and other materials for the classroom. Such content goes beyond traditional text books since it can demonstrate a process such as blood circulating round a body through animation. It also provides a way for students to practise their research skills using digital information so preparing them for their future workplace.

Curriculum



When integrated correctly into the curriculum learning can be accelerated through ICT. When done poorly it can break any strategy to introduce ICT into schools. Curriculum policy should address learning about ICT, learning with ICT and learning through ICT.

“The initiative (Microsoft Partners in Learning) had a dramatic effect on the curriculum. Teachers are incredibly enthusiastic about the role of IT in the classroom and pupils are much more motivated to learn,” Professor Abdur Rauf, Director of Education, Federally Administered Tribal Area, Pakistan.

“During the course candidates should be given opportunities to: use calculators and computer software including spreadsheets, LOGO, a dynamic geometry package and computer algebra system; use computers as a source of large samples,” part of Mathematics curriculum for Malta.

PCs, networks, and learning software are mere tools for teachers and students: e-strategies for education must address not only the supply of ICTs and associated issues of connectivity and accessibility, but also their integration into the curriculum. Curriculum policy must, in turn, be developed in line with the wider policies of implementing access, connectivity, and power. For example, where connectivity and networking capabilities are to be rolled out over a period of ten years, network based elements in the curriculum such as communication and collaborative must be rolled out in a similar way to match the capability. Curriculum drives educational activity and must cover most aspects of using ICT in schools, apart from management of schools. Curriculum policy can be thought as addressing three themes: learning about ICT, learning with ICT, and learning through ICT.

In learning about ICT, students and teachers acquire real-world abilities: the basic and advanced technology skills required by the citizens of the 21st century. Such training also provides for a cadre of skilled technical support specialists and for the policy makers (headmasters and government officials) who need to understand the capabilities of the technology in order to determine how it should be implemented.

However, the policy needs to go further than this. The delivery of curriculum and of learning can be enhanced with ICT such as word processors, spreadsheets, and on-screen calculators. Learning can be accelerated through ICT: interactive learning packages and simulations, distance learning courseware, on-line content that stimulates innovation and creativity offer the opportunity for individualised or collaborative working, broaden access to knowledge, and provide fast connections to the global learning community. This redefines the role of the teacher, allowing them to spend less time instructing at the front of the classroom, and more time coaching and directing individuals and smaller groups of children. ICTs provide access to a wealth of teaching resources such as lesson plans, curriculums, digital content, and communities of best practice.

Curriculum continued



When creating training materials for teachers, students, and citizens in schools and in the community, they must be matched to the needs and priorities of the local education systems e.g. the language of instruction. These localised curriculums need developing to international standards and will provide teachers with the skills they require to successfully integrate ICT into the curriculum and in turn produce students and citizens capable of competing internationally. Where possible this should be done with local partners to help build local capacity and open up economic opportunities for people and businesses.

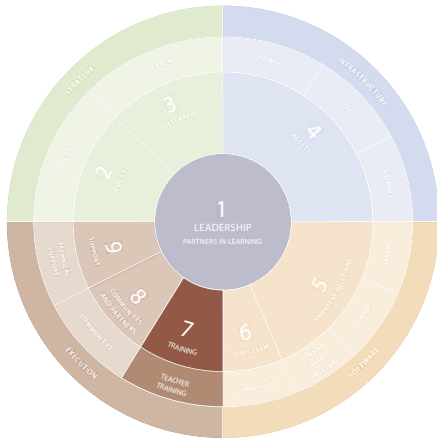
Jordan Education Initiative

Under the Jordan Education Initiative (JEI) and in collaboration with the Ministry of Education and Menhaj Educational Technologies in Amman, Microsoft is leading the development of the ICT National Curriculum, grades 1 to 10, for state schools. The curriculum consists of some 520 lessons, which have all been written locally, and includes multimedia elements for every lesson. The project will help build IT capacity for human resources to enable them to achieve His Majesty King Abdullah's vision of transforming Jordan into the ICT hub of the Middle East, while exporting Jordanian-made educational material abroad, as the curriculum will be promoted in more than 60 countries.

A Curriculum for Teachers

The creation of localised teacher training curriculum was a key task for the Namibian Pathfinder. A teacher training policy was formulated based on the current skills base and the future needs of the curriculum and was reviewed on the basis of results from a national programme to evaluate the effectiveness of ICT in supporting learning. Teachers were evaluated for their ability to engage with ICT in learning and teaching and curriculum materials were constructed around individual needs. The integration of different packages from a learning suite were explored as a generic curriculum platform and teachers, due to their level of expertise, decided to adopt this platform before exploring subject specific software. The most notable success included a teacher that was able to construct e-learning materials just two days after picking up a computer mouse. To quote one of the teachers attending "Microsoft has really thought about the training and has helped me lose my fear of computers."

Training



Managing the change in schools when ICT is introduced requires relevant and coordinated teacher training ensuring all staff in the school know what they are doing, and how to do it. The same ICT tools used for learners can be used to accelerate developing teachers, including helping to address global shortages of teachers.

"One of the most pervasive is a shortage of facilities and teachers, often due to financial constraints. ICTs can help overcome these shortages in an efficient and economical way for countries facing budgetary limitations," World Telecommunication Development Report 2003.

"If developing countries are to make effective use of the chance to join the super-highway, there is a need for a special effort to build the pool of human resources. A massive investment in education and skills transfer is essential if the South is to compete in the global communications marketplace. This too requires long term international co-operation," Nelson Mandela speech to the opening ceremony of Telecom 95 3rd October 1995, Geneva.

Critical to any successful change in an education system is teacher training. Ensuring teachers have the new skills required, that head teachers understand the way forward, schools inspectors know what to look for etc. The starting point is the educational e-strategy. This provides the directions upon which subject curriculums evolve around ICT provision. In turn this leads to pre- and in-service teacher training curriculums that provide the teachers with the skills to use and integrate ICT into their classrooms i.e. the teacher training curriculums. Depending on implementation, other curriculums for the educational workforce are required to cover things like training staff for measuring and managing ICT in schools.

Vital teaching skills include a basic understanding of the technology, operating systems, and applications available in order to ensure effective troubleshooting; to integrate ICT effectively into the learning process, developing an innovative approach to the use of computers in the classroom; and to be able to train other teachers, building sustainable local capacity. Programmes must not neglect training for head teachers, and government policy makers. Both must understand the capabilities of the technology in order to determine how it should be implemented and to run the programme in the longer term. Provision must also be made for training technicians who will provide crucial long-term technical support – these may be teachers, or external partners as well as schools staff.

Studies have shown that it is easy to deliver training ineffectively. A study¹⁶ commissioned by NGO SchoolNet Africa (SNA) in partnership with the Commonwealth of Learning, the International Institute for Communication and Development, and the Open Society Initiative of Southern Africa in October 2004 reports a disappointing situation across Africa. The majority of interventions into ICT for teacher training provide little or no long term positive effect. Without a clear policy that links, for example, the delivery of PCs to the establishment of power networks and just in time teacher training initiatives, training will be fragmented and ineffective.

¹⁶ Treat refurbishes and Africa with respect: Towards a framework for the use of refurbished computers in African Schools, SchoolNet Africa, March 2004

Training continued



A key focus of many e-education projects is the capacity development of teachers. UNESCO state that more than 30 million new teachers are needed to meet universal primary education goals by 2015¹⁷. In Zambia, an estimated 815 primary school teachers died of AIDS in 2000¹⁸: 45% of all teachers trained that year. And such problems are not confined to sub-Saharan Africa. Teacher shortages also affect OECD countries, including the United Kingdom, the US, The Netherlands, and Germany. On top of the strict limitations imposed by access and infrastructure, a lack of adequate training is one of the main bottlenecks, demanding pioneering solutions.

Teachers' workloads mean that they often have limited time to learn new skills and one of the challenges is ensuring that ICT training for teachers is flexible, does not add to the burden of teaching, but enhances, and supports the teachers' approach. Here, ICT can in itself be an important tool, providing opportunities for learner-centred, individualised learning. Regional e-learning networks, self-paced learning programmes and discussion groups provide teachers with a means to develop their own ICT skills, engage with other, geographically-separated teacher/learner communities, and discover ways in which ICT can be integrated into their teaching methods. Such opportunities produce a cadre of teachers with diverse skills, letting schools extend the range of courses that they can offer without having to recruit specialist teachers.

The overall aim is to produce teachers who are confident and comfortable in their use of ICT. This is well summarised by the researchers at the University of Tasmania¹⁹ who describe it as: accepting its limitations, confidence in its potential to be useful, confidence in oneself and one's associates to select, operate and apply the available technology appropriately. To achieve this teachers need to have: sufficient experience of the technology to be convinced that it can be used in the teacher's own situation to achieve the intended purposes, sufficient understanding of the technology itself to be confident about his/her ability to operate (or enable others to operate) the available technology to the achievement of the intended purposes, sufficient support and encouragement to make the endeavour significant and successful. Research has shown that those teachers who use computers at home tend to use ICT more in school²⁰.

Developing programmes that offer teacher good value when purchasing PCs is an excellent way to achieve e-confidence in schools and build on ICT training received by teachers.

Training is also an issue in the wider community where many adults require access to ICT training applicable to their own lives, to the creation of small businesses, and to larger business operations. Computers and interactive e-learning software can offer a flexible means of delivering education or training to these sections of the population. And by using the same ICT facilities installed in schools and colleges, it maximises the return on the investment whilst helping to support the creation of a wider knowledge economy.

¹⁷ http://portal.unesco.org/education/en/ev.php-URL_ID=37695&URL_DO=DO_TOPIC&URL_SECTION=201.html

¹⁸ http://portal.unesco.org/education/en/ev.php-URL_ID=37707&URL_DO=DO_TOPIC&URL_SECTION=201.html

¹⁹ http://www.educ.utas.edu.au/users/ilwebb/Research/teacher_confidence.htm

²⁰ <http://www.scotland.gov.uk/library/ict/append-section3.htm>

Microsoft IT Academies for Teacher Development

In response to skills shortages, Microsoft is making a substantial commitment over the next five years to invest in technology skills training for teachers, students, and communities worldwide. Microsoft will support the establishment of 4,000 local Microsoft IT Academies through joint partnerships with local community organisations, education institutions, and Government training centres. These Academies will provide training for both digital literacy and more specific product training at basic and advanced levels. Above all, they will provide teachers with the confidence to develop an appropriate approach to the use of computers in the classroom and tailor technology to the needs of every pupil.

Teacher Training Blueprint

Working closely with Namibia's Ministry of Education's National Institute for Educational Development, we supported teacher training for the Pathfinder schools. In April 2004, two teachers from each of the 13 pilot schools were invited to Okahandja for their first computer training session. For many this was the first time they had used a PC and so great was the interest and desire to learn that over 40 teachers turned up, some having travelled over 900 km by car to attend the two-day event. This training, along with more training organised by Microsoft in Namibia, and other countries has led to the creation of a Microsoft Teacher Training Blueprint. This is now being used in over 20 countries for training tens of thousands of teachers. The Blueprint is designed to be used in a series of short courses that start with basic ICT literacy for teachers, develop themes of using ICT in the classroom, and build up to training education leaders how to manage the change around introducing ICT to their schools.

Communities and Partners



Creating communities for sharing knowledge between teachers and other stakeholders is essential to accelerate learning, spread best practice, and ensure inclusion for people in remote locations. Communities of partners are also needed to deliver services across a country in a joined up way. In some countries these partners may not exist and support may be needed in order to create the local capacity. Schools are often at the centre of local communities and implementing ICT in a school provides the gateway to include the full community by creating Community Technology Learning Centres.

"Knowing now how innovative our teachers are, we can confidently create a network to exchange our best practices and share our knowledge," El Houcine Jarrad, Head of the National Center of Renovation and Experimentation in Education, Morocco.

"At the Global e-Schools and Communities Initiative, we believe that programmes to improve education by deploying ICTs in schools can also improve the economic and social well-being of the wider community. These platforms can provide an ideal mechanism for linking residents to the outside world, help increase the education level of the overall populace, and give access to health and government services. In short, ICTs deployed in schools to help redress educational deprivation can also help to accomplish wider development goals," Global E-Schools and Communities Initiative.

Sharing best practice and learning from others is a universal maxim: countries may create networks of universities, an entrepreneur education system, technology incubators and early stage funding to support entrepreneurs, but the most important factor is networking and the sharing of learning and best practice.

Nowhere is this truer than in education. Central to the Microsoft educational policy is the notion of a Connected Learning Community. Leadership Forums are just one example of these dynamic communities which use learning networks and discussion groups to plan, innovate, share ideas and information, and test ICT solutions, so bridging the divide between borders, cultures, and languages. A Connected Learning Community will involve not just teachers but the wider education community including government policy makers and the implementation community including NGOs and private sector organisations.

Innovative software solutions and global networks allow the creation of online communities. These offer lower cost alternatives to the traditional conference and exhibition for teachers to come together and network, and in many cases reach broader audiences. The creation of teacher communities and learner communities through the use of e-mail, electronic bulletin boards, content sharing, and discussion forums etc can provide inclusion for teachers and learners in remote rural location and provide inclusion for people with communication challenges e.g. deaf students.



By joining these community networks, teachers can cross barriers in an instant and learn from colleagues using new teaching methods hundreds or even thousands of miles away. Teachers become the champions of their own cause and, as a community, reach new levels of understanding and unity. Members are able to take advantage of learning opportunities designed to enhance their understanding of ICT in education as well as participate in professional development programmes designed to make them better teachers, and broaden their career opportunities.

Using schools to create communities and partnership must extend beyond just educational users by providing ICT access and peer-networking opportunities for the wider community e.g. parents, entrepreneurs and farmers. It allows those restricted by social norms, such as women who make up 70% of the 1.3 billion people living in poverty²¹, to access information and resources that would not otherwise be available to them. The schools act as 'hubs' where different social networks can interact and make use of the ICT in support of their business, for learning and for accessing information about government services. The ITU World Telecommunications Development Report 2003 provides ample evidence of these wider benefits. For example, there was a 10% decrease in infant mortality among low income families with access to telemedicine in the US and a 50% decrease in maternal mortality following an ICT-based programme in Uganda.

Another significant community are the partners who provide implementation and support services. The public-private, multi-stakeholder partnerships advocated by UNICT Task Force for large-scale ICT for Development projects will succeed only if sufficient local partners can be found. Where indigenous capability is lacking, governments must put into place the economic incentives for partner creation to ensure the sustainability of projects in the longer term. This requires reasonable economic models for implementation that support the creation, and enlargement of in-country partners with the extra benefits this brings to SME development and support. Many large multinationals already have significant experience of partner networks and supporting them. By including such partners in Leadership Forums and knowledge communities their knowledge and experience can be used. Such partner networks should have qualifying standards so that users feel confident that they are dealing with knowledgeable experts who understand the solutions they are deploying, and so are able to deliver efficiently with good quality. Examples of already existing partner communities include the Microsoft Authorised Education Reseller (AER) programme that has tens of thousands of worldwide partners that have qualified in providing educational solution. Similar communities are available from other multinational ICT partners e.g. the Certified Education Partner (CEP) from Hewlett Packard, Cisco's Education Partner programme.

²¹ "Information and Communication Technology: Gender Issues in Developing Nations", Kimberly Betz Leahy and Ira Yermish, St. Joseph's University, Philadelphia, PA, USA, Informing Science Journal Special Series on Community Informatics, Volume 6, 2003

Win win partnership by Windhoek College and CECS Namibia:

Partnerships not only share knowledge but can go beyond this to provide innovative support models. At Windhoek College of Education, Microsoft was creating a Teaching Academy to help the lecturers and pre-service teachers develop their use of ICT. The sustainability of the project and ability to reproduce it at other colleges was not initially viable because the colleges lacked ICT technicians and lecturers. In response to this Microsoft found a partner for the College. The partner, a local ICT training NGO called CECS Namibia, wanted a base in Windhoek to offer ICT training for the community. By including the Ministry of Education as a third partner, a framework was agreed where by CECS Namibia now runs the IT Academy on behalf of the college. They provide a number of free training places to college lecturers and students, as well as provide technical support. In return they can offer community training which provides the funds to run the Academy.

Innovative Teachers Networks

Microsoft Innovative Teachers Network's Arabic launch in May 2005 gave teachers throughout the region an opportunity to join a unique regional network of peers offering educators instant access to a wealth of knowledge and experience along with the opportunity to discuss best practices. Registered members of this pioneering digital library will have access to virtual classroom tours and a full database of teaching, training, and subject materials that they can tailor to meet their particular classroom needs, thereby speeding up the creation of local content. Users don't have to pay to become a member of the network, which is accessible 24 hours a day, seven days a week, and dedicated to improving the core competencies of teachers worldwide.

Support



Without good technical support, maintaining and implementing ICT in schools will fail. Constraints in resources, and wishes to develop local capacity, mean the creation of peer support networks using educational organisation, staff, and learners can prove cost effective. Good access to resources for developing and supporting such peer networks are needed.

“Total cost of ownership is often underestimated, sometimes grossly, when calculating costs of ICT in education initiatives. Estimates of initial costs to overall costs vary widely; typically they lie between 10-25% of total cost. Hardware costs typically decrease, often quite dramatically, over time. Software costs are typically quite low as a percentage of overall investment, and remain so over time. Maintenance and training costs vary greatly, and typically do not decrease over time,” The Information for Development Programme.

“Microsoft has listened to the needs of the Jordanian Education sector and delivered a new technical assistance and software support service. It is a strong indication of Microsoft commitment to Jordan’s education initiative and the ministry’s reform efforts,” H.E. Kkalid Toukan, Minister of Education, Jordan.

Reliable, affordable, and accessible ICT support is a precondition if ICT is to be embedded into schools’ educational and administrative systems. Confidence in ICT systems must be built at all levels in the educational system for its successful use, so addressing support is a vital and integral part of any e-strategy. However relatively few countries have built a low cost and sustainable technical support model for their schools. In practice solving technical problems often falls upon teachers. These teachers normally lack sufficient skills to operate and troubleshoot a school’s ICT facility (network, software, hardware).

Support costs start from the decisions made when selecting solutions. For example, by changing from fixed to wireless networks in Pathfinder deployments, the time to install was reduced with no increase in cost of materials. This meant installation was faster and cheaper. Similarly, the innovative schools software meant PCs could be installed by unskilled staff, once more reducing bottlenecks for implementing and reducing costs. The impact of an initial decision carries on into functionality and how complex your final solution is. For example, if you require three software packages to achieve the same solutions as a single package, this will require greater installation and support costs (as well as being more complex for end users to use). An ability to consistently control access permissions and rights will also reduce costs by minimising intentional and unintentional misuse of computers by students and teachers e.g. downloading viruses, malicious damage to files. By considering issues such as this, a total cost of ownership model can be created to understand where support will be needed, and where innovative integrated solutions can reduce support costs.

Support continued

ICT support, including maintenance, support, and training, often accounts for over a third of the total cost of ownership of ICT resources. Badly planned support strategies can therefore drain school ICT budgets. Research on support costs has shown that many calls, for help are actually trivial issues. For example, a helpdesk survey by Gartner found a fifth of calls were by users needing their password reset²² – not a problem requiring technically skilled staff to solve. This highlights the fact that a simple technical training programme for front line users of ICT, teachers, and students, can significantly reduce support costs and provide a better experience for users.

Policy can be designed to help minimise the costs of support. Providing trained teachers with a PC to take home will build e-confidence by allowing them to become more familiar with the technology and therefore more confident of tackling technical issues as they arise. Whilst technical support costs can be minimised through configuration, care should be taken not to reduce functionality to the point that it impacts on learning goals. During the Pathfinder, schools initially had such high security in order to reduce support, that certain functions they needed were not possible. This was quickly rectified but highlights the need to balance security and control of support costs with functionality required by curriculums.

The creation of peer networks of teachers, where technically-trained teachers in turn train other teachers, creates a sustainable and growing support network, and can be supplemented by Connected Learning Communities of teachers, students, and technicians, who provide instant access to a wealth of knowledge and experience. These knowledge sharing communities can extend beyond regions to access knowledge from other countries as well as national higher education establishments with ICT expertise.

Another positive solution is the creation of student-run help desks, often using senior students as part of their personal development. Student IT skills development and aptitude assessment can be supported by curriculum resources such as CDs and self-paced workbooks. They then provide schools with a resource to support technology at school level or through communities. Initiatives such as these work well in because the students themselves are keen to learn and often more adept with the technology than their teachers. Such facilities help schools to resolve the majority of technical problems locally and introduce processes that track technical issues, the first step toward a more proactive IT management process.

Empowering schools with the skills to solve problems locally can address many of the problems they encounter. However, there is always a need for access to more expert technical support from partners in ICT departments of higher education institutions and access to traditional commercial support helpdesks. These services can often be tailored to schools' needs and Leadership Forums are good places to develop such services.

²² <http://www.microsoft.com/presspass/features/2005/feb05/02-01SpeechServer.aspx>

Education Support Centres

To ensure that more complex technical issues are solved, Microsoft is providing training, guidelines, software, and expertise in setting up centralised national Education Support Centres to which schools are able to escalate their unsolved technical problems. Education Support Centres are normally set up in partnership with universities and provide the education sector with expert, affordable, and effective frontline technical help and advice on Microsoft technologies, ensuring that users can maximise the potential of their existing IT investments. The use of in country ICT students from higher education provides many benefits: reducing culture barriers present in global support mechanisms; being cost effective by having local not global costs; providing work experience for students; creating linkages between ICT researchers and users to provide input for creating local research projects that help educational e-strategies. Microsoft is supporting the creation of a global network of these national centres to accelerate the sharing of support knowledge across continents.

Supporting all of Bulgaria's schools

Microsoft partners and the Bulgarian government have developed a national helpdesk for their 3,100 schools. Staff at schools register to be able to call the helpdesk and get commercial level support on the Microsoft software they use in the schools under a national licence agreement. By using an existing commercial helpdesk, costs of setup and running were minimised, and economies of scale achieved as well as jobs created.

All Bulgarian teachers passing Microsoft localised Partners in Learning training will be registered as able to use the helpdesk as a back up for their new found knowledge.

Conclusion

"The young people of the world must be empowered to participate in the building of the information age. They must become the citizens of global information society. And we must create the best conditions for their participation," Nelson Mandela, Telecom 95, Geneva.

"The most important aspect of the programme is the benefit it has for Namibian society in terms of building ICT skills not only in schools but also at community centres. Instead of looking at a computer as something that is daunting and unapproachable, it's been made simple for people to switch on a computer, type a letter, go to the internet, send e-mail, or go to the Parliament Web site to communicate with their member of parliament, wherever they are," Isabella Wellman, Director of the Office of the Speaker of the Namibian National Assembly.

"The e-village is a national initiative that enhances his Majesty's vision for Jordan to become the IT Hub of the Middle East. It is the first project of this kind in Jordan and it will build the capacity and professional skills of village citizens and allow them to benefit from different job opportunities. The Microsoft contribution to this project is a testament to the company's commitment to building local economic opportunity and social inclusion through its citizenship programmes." Nadia Saiid, Jordan Minister of Information and Communication Technologies.

The biggest lesson from the Blueprint for Schools and its use in the African Pathfinder is that it is possible for any country to provide a total solution around implementing ICT in schools.

It is also clear that implementing ICT in schools is really implementing ICT for the local community, extending digital inclusion beyond students and their teachers e.g. parents, entrepreneurs, and health workers.

The challenges for those wishing to start down this path are those of creating communities and partnerships that provide leadership and knowledge. Programmes like Partners in Learning from Microsoft are already showing how to train tens of thousands of teachers. Partnerships like Digital Pipeline are showing how to bring down the cost of hardware. Leadership Forums are showing how a national vision for ICT in schools can be supported.

The infrastructure for satellite delivery already exists. Rich digital content such as Microsoft multimedia encyclopaedia Encarta is bringing up to date and engaging knowledge to learners and teachers. Products like Learning Network Manager are available to reduce the support costs, and global Education Support Centre networks are in place providing back up to national support centres. National Schools Licensing agreements are available to provide access to the latest and most popular software at manageable and predictable costs. We have School Technology and Innovation Centres to help education leaders shape practical policies around implementing. Proven training curriculums for producing technically skilled workers are available and widely used e.g. IT Academies.

The question to ask yourself is: "What are we doing to use this knowledge so that we can accelerate learning in our schools?"

Glossary of Microsoft Solutions and Initiatives

Solutions and Programmes to 9 critical components in the Blueprint

	Leadership	Policy	Research	Access	Innovative Solutions	Training	Curriculum	Communities and Partners	Support
Learning Network Manager				●	●				●
Learning Suite					●		●		
Learning Gateway					●			●	
Partners in Learning (inc Grants)	●		●			●	●		
Fresh Start				●					
Microsoft Authorised Refurbisher				●				●	
Authorised Educational Reseller					●			●	
Schools Technology & Innovations Centres		●	●					●	
Education Support Centres								●	●
Blueprint for Teacher Training						●	●		
Digital Pipeline				●				●	
National Schools Agreement		●		●	●	●			
IT Academy						●			●
Blueprint for Schools	●	●	●	●	●	●	●	●	●
Innovative Teachers Network			●			●			●

Glossary of Microsoft Solutions and Initiatives continued

Microsoft Partners in Learning

The Partners in Learning initiative aims to empower teachers and students to achieve their fullest potential by providing a sustained investment to address local education priorities through comprehensive ICT skills development, locally tailored training for teachers on ICT integration into curriculum and learning, and greater access to the latest computer and educational technologies. The initiative brings together governments, the IT industry, private enterprises, and, most importantly, educators to provide critical infrastructure investments and know-how, establishing scaleable and sustainable models for student access, teacher training, and skills development.

During a five-year-period Microsoft is investing over \$250 million globally and supporting governments in building the most effective ICT strategies for their countries.

www.microsoft.com/partnersinlearning

Partners in Learning Grants Programme

These provide investments to create sustainable models for improving the use of ICT in education.

www.microsoft.com/emea/education/partnersinlearning/pilgrant.mspix

Microsoft Authorised Refurbishers Programme (MAR)

MAR enables authorised PC refurbishers to re-install Microsoft Operating Systems onto pre-used PCs for schools, charities, not for profit organisations, and community centres.

www.microsoft.com/emea/education/partnersinlearning/mar/mspx

Partners in Learning Fresh Start

Fresh Start is specially designed to make it easier for schools to use donated PCs, safe in the knowledge that their equipment uses properly-licensed software. It removes licensing barriers, by providing a licensed copy of Windows 98 or Windows 2000 Operating System for PCs (Pentium II or older) directly to all participating schools.

www.microsoft.com/emea/education/partnersinlearning/freshstart.mspix

Partners in Learning School Agreement

School Agreement offers educational discounts through the Microsoft School Agreement Subscription Volume Licensing programme for disadvantaged schools. Participating schools will receive free upgrades to Windows XP Professional for both new PCs and existing PCs. Microsoft Office Professional and training materials are available to qualifying schools at a very special low annual fee.

www.microsoft.com/emea/education/partnersinlearning/schoolagreement.mspix

Microsoft Learning Network Manager

Learning Network Manager offers a new standard way for schools or universities to set up and configure computer labs, reducing support, and training requirements. The product provides a controllable infrastructure that can be customised to meet institution needs, or build on existing investments.

Learning Network Manager is designed to meet the complex requirements of geographically dispersed educational networks, making it ideal for Europe, Middle East and Africa – where infrastructures and facilities vary greatly between developed and emerging markets. Learning Network Manager is designed to meet the demands of any education institution.

For more information about Microsoft Learning Network Manager visit www.microsoft.com/emea/education

Innovative Teachers Network

The Innovative Teachers Network is a place where teachers can come together to share ideas, passion and enthusiasm, and work and innovate in a collaborative environment online.

The Web site offers a secure, members-only education portal offering rich content, discussion boards, survey polls, file storage, shared and dedicated communities, and advanced search facilities—all customisable for individual or group needs.

Registered members can access and share a wide array of teaching, training, and subject-related materials, including lesson plans, for review or for classroom use. The Web site provides educators with tools to develop individual and organisational competencies, share best practices, and continue their professional development.

For more information on the Innovative Teachers Network visit www.innovativeteachers.com

Glossary of Microsoft Solutions and Initiatives continued

School Technology Innovation Centres

Technology has a powerful role to play in education, and nowhere more so than in School Technology Innovation Centres – where the aim is to help educators and educational policy makers realise the full potential of the effective use of ICT in teaching and learning. The Centres are long-term partnerships between Microsoft, Hewlett Packard, Cisco, Intel, and governments.

Six key areas are central to the overall objectives of the Centres:

- Innovative Technology
- Innovative Leadership
- Innovative Teaching
- Innovative Solutions
- Innovative Community
- Innovative Partnership

For more information please visit.

www.microsoft.com/emea/education

Microsoft Learning Gateway

The Microsoft Learning Gateway is a secure portal providing a framework for blending e-Learning solutions under one fully managed environment. The Learning Gateway delivers secure, web-based collaboration, communication and content delivery services to all levels: lecturers can manage their administrative workload, learners are empowered to learn at their own pace, and academic institutions can become more involved in the hands on management of their learning environment across their campus.

The Learning Gateway is designed to put the student at the centre of the learning experience. Its customisable solutions for self-paced learning mean that students can gain knowledge at their own speed. The lecture theatre extends to any location where the student can be online, allowing for study either on campus, at home or with friends.

For more information on Microsoft Learning Gateway visit.

www.microsoft.com/emea/education/microsoftlearninggateway.aspx

Microsoft Learning Suite

Learning Suite is an offering designed to highlight the value of Microsoft desktop applications working together within education, to help teachers and students address new ways of learning and teaching. The suite of products is available only for School Agreement and Campus Agreement customers (volume licensing deals for customers). The main components of the Learning Suite are: Microsoft Windows® XP, Microsoft Office Professional, Microsoft OneNote®, Microsoft FrontPage®, Microsoft MapPoint®, Microsoft Digital Image Suite, Microsoft Encarta®, Microsoft Project, Microsoft Visio®, Microsoft Producer, Microsoft Movie Maker, Microsoft PhotoStory 3, and Learning Essentials for Microsoft Office.

For more details visit.

www.microsoft.com/emea/education

Microsoft IT Academy

Education institutions face a number of challenges. They have to identify worthwhile IT courses that will equip their students with the skills they need to attract employers. They also need to train staff intelligently, giving them both the knowledge and confidence they need to deliver against the set curriculum. Also, schools and colleges are increasingly becoming the focal point for local communities, providing IT courses that cater for adult learners.

The Microsoft IT Academy Programme supports education institutions in delivering IT training. It provides them with faculty training, Microsoft software licences, and discounts on courseware and certification exams. Students gain early access to the latest technologies and hands-on experience, which enhances their career opportunities.

For more information on Microsoft IT Academy visit.

www.microsoft.com/emea/education/ITAcademy.msp or

www.microsoft.com/education/msitacademy/worldwide/default.msp

Digital Pipeline

The Digital Pipeline generates a sustainable supply of PCs, while supporting local capacity building for increased access to technology. The Digital Pipeline is a multi-stakeholder approach to establishing computer refurbishment centres where surplus computers from developed countries are obtained and reconditioned for use in schools and other organisations at a very low cost.

Microsoft supports the programme to help bridge the digital divide by taking advantage of the increasing number of PCs that are discarded each year by businesses and other organisations.

The initiative supports key Millennium Development Goals, including having the private sector make the benefits of new technology more widely available and, by 2015, ensure that children everywhere are able to complete a full course in primary schooling.

For more information on the Digital Pipeline visit www.digitalpipeline.com

Microsoft Education Support Centres

Microsoft, together with local partners chosen from the national education sector, is now developing a new kind of support offering within countries in Europe, Middle East, and Africa to provide the education sector with expert and affordable technical help with Microsoft technologies.

The Education Support Centres deliver technical assistance and software support for Microsoft products. The Centres are staffed by students & focus purely on supporting the education sector.

For more information on Education Support Centres please visit

www.microsoft.com/emea/education

Glossary of Microsoft Solutions and Initiatives continued

Microsoft Authorised Education Reseller (AER)

Microsoft has developed a range of licences and agreements for education organisations. Microsoft does not sell software directly, but through a network of resellers. Authorised education resellers can sell Microsoft products at reduced prices to eligible educational users.

For more information on AERs visit

www.microsoft.com/emea/education/howToBuy.aspx

Microsoft Unlimited Potential

Microsoft Unlimited Potential is a global programme that focuses on improving lifelong learning for underserved young people and adults by providing technology skills through Community Technology Learning Centres (CTLCs). Microsoft brings together the following the critical components to support the CTLCs:

- Unlimited Potential Grants – enhancing access and training opportunities for individuals underserved by technology.
- Software Donations – providing community centres and NGOs with access to the most current productivity applications necessary to train people for the global economy.
- Unlimited Potential Community Learning Curriculum – localised in 8 languages to date, it provides support for training on computer fundamentals and real-world applications and course materials.
- Community Technology Support Network – in partnerships with IDRC and UNESCO, Microsoft is offering capacity building services to the community of teleCentres world wide.

Each course in the Unlimited Potential Curriculum is designed for motivated young adult and adult learners who are seeking to learn new technologies or build on current technology skills, either for personal or professional reasons.

For more information on Microsoft Unlimited Potential visit:

www.microsoft.com/emea/microsoftEMEAPProfile/corporateCitizenship/inTheCommunity/unlimitedPotential/default.aspx



