INTRODUCTION

Two decades of war have left Afghanistan battered and impoverished, facing major problems of reconstruction. Among these is the scale of the country’s educational needs where even to restore the education service to the state it was a decade ago would leave it miserably inadequate. Planning is also hampered by the shortage of information. Basic data are scarce; there are, for example, no recent figures for primary and secondary enrolment ratios, but 10 years ago Afghanistan’s figures were among the lowest in the world. Figures are also not available for telephone, Internet and PC users. (Table 1 illustrates how limited are the data on Afghanistan usually available from international sources.)
National policies, strategies and programmes

Afghanistan’s recent history means that there has been a flurry of policy-making, much of it co-ordinated and possibly dominated by external agencies with key planning documents being developed outside the country. At this point it is impossible to forecast how far the Afghan government will have the capacity to implement plans that are being developed or how far the international community will fund either the capital or the recurrent expenditure needed to make them a reality.

Early steps towards an Afghan education policy were taken at a meeting of Afghan educators in Peshawar in 2001 with support from UNICEF in “An Afghan Perspective on Education.” It set out a series of goals including the development of a national vision for education, the broadening of educational opportunities for all children, especially for girls, recognition of the importance of teachers and the improvement of educational policy-making and management.

Thinking of this kind fed into the substantial “Afghanistan Comprehensive Needs Assessment in Education” developed in 2002 by a team of agencies. It estimated primary gross enrolment ratios of 38 per cent for boys and three per cent for girls, and secondary enrolment between five per cent and 11 per cent. It noted that there were 3.5 million refugees outside Afghanistan and one million internally displaced people within the country. Some 80 per cent of school buildings had been destroyed in the war and Afghanistan needed an extra 43,500 teachers and 13,851 schools. The refurbishment and expansion of schools, measures to encourage children back to school and the expansion of teacher training were seen as priorities. The Assessment makes little reference to information and communication technologies (ICTs) beyond proposals to use radio in a back-to-school campaign and in a child development communication strategy for preschool children.

Policies have been developed for telecommunications. Indeed policy may be ahead of practicality as “Afghanistan has a barely functioning, very limited telecommunications sector” with little capacity outside the main towns of Kabul, Herat, Mazar and Kandehar. With support from the United Nations Development Programme (UNDP), a seminar in Kuala Lumpur in 2002 developed an ICT policy which drew on existing national telecommunications strategy and telecommunications strategy issued by the government earlier in the same year. The seminar identified three objectives to be pursued: the development of ICT networks that would be accessible and affordable to all Afghans, policies for universal access to information and knowledge and improved government use of ICTs. It recognised that attainment of these goals was far off and, among other strategies, proposed arrangements for a national ICT council and arrangements to strengthen training in information technology. Among the groups it identified as priorities were teachers. It also recommended that “government emphasis on IT education in primary and secondary schools should be elaborated.”

The national policy documents do not discuss their educational implications in detail. They assume that the private sector will play a major role in the expansion of telecommunications, but require that as a condition of their licence telecommunications operators should contribute to “the achievement of national universal access objectives” while the regulatory commission will identify targets for universal access and encourage the development of multipurpose community telecentres.

Current level of ICT use

Afghanistan has an established educational radio and television service, although these are now reduced to two hours and one hour 10 minutes per week respectively. The government of Italy, with UNESCO, has funded a two-year programme to restore the former educational television headquarters in Kabul and provide new studio equipment (see www.learningchannel.org/article/archive/1740).
A seminar, involving both national and international participants and organised by the Ministry of Information and Culture, agreed in September 2002 both that Radio-Television Afghanistan should be transformed into a public service broadcaster and that arrangements should be put in place to license independent broadcasters (www.unama-afg.org/docs/media/declaration2.htm). These decisions, coupled with the existing experience of educational broadcasting, mean that Radio-Television Afghanistan may have a significant role to play in education during and following reconstruction. The Afghan delegation reported to a UNESCO meeting in Bangkok in 2003 that its priorities in educational radio and television were to provide teacher training programmes for primary school teachers by radio, with a half-hour programme every day together with a repeat, and to produce a daily half-hour basic literacy course by television. It is not clear from the report how far these proposals fit with Ministry of Education priorities or how they might relate to the work of the British Broadcasting Corporation (BBC). The same report also shows that 1,450 radio receivers are needed for each primary school – a figure that suggests there are no working radios in school at present.

External players are also important in relation to broadcasting. During the Taliban period, the BBC World Service launched an educational radio soap opera which still continues and attracts large audiences (see below). In higher education, international operators including Purdue University in the United States, the Technical University of Berlin and the software company CISCO have announced plans to expand work in computer-based systems in cooperation with Afghan higher-education partners. The CISCO Networking Academy – apparently funded by the European Commission and with UNDP support – is designed to teach computer skills to civil servants, civil society organisations and the general public.7

Computer-based work in classrooms is thought to be minimal. There is, however, interest by the international agencies in what might be needed if computers began to be used for education in any significant way. UNDP, for example, with funds from the European Union, has carried out a review of the problems of displaying text in Pashto and Dari on a computer screen, while noting that less than three per cent of the population of Kabul know how to use a computer, with lower figures from other parts of the country.8

**Major initiatives**

“New Home, New Life”

The BBC World Service launched a Pashto service for Afghanistan at the time of the Soviet invasion in 1981. Since then it has developed a series of educational broadcasting activities, calling on the skills of the Afghan refugee population, which are now run through a separate agency, the BBC Afghan Education Projects (BBC-AEP). An educational radio soap opera, “New Home, New Life” (NHNL) was launched in 1994 during the Taliban regime. It continues today and has now been repatriated from Peshawar to Afghanistan.

NHNL was designed to meet educational needs of both refugees and those in Afghanistan. It drew on the understanding of the BBC-AEP Afghan staff and on the specialist knowledge of donor agencies in order to develop educational messages across a range of topics, including repatriation, reintegration of returnees, mines awareness, health, hygiene and sanitation, and conflict resolution. These messages were incorporated into a storyline about the lives of villagers in three fictional villages in Afghanistan.

The soap opera format has proved powerful in allowing the same theme to be repeated in different contexts without boring the audience. People identify with the characters and the storylines, so much so that, for example, BBC-AEP has received many messages from listeners offering to find a bride for the character Nazir, the night watchman. And when listeners gossip about NHNL, they also repeat and reinforce the educational messages in the stories.

NHNL very quickly gained a mass following, mainly because it provided entertainment as well as information and advice. As the crisis in the country deepened, the show became the only source of entertainment for many Afghans – and the only thing that Afghans inside and outside Afghanistan had in common. And it was successful: a survey of 60,000 households undertaken in 1997 found that a dramatic fall in the number of mine accidents after 1994 was due to the impact of mines awareness messages in the soap opera. Around 50 per cent of people interviewed listened daily to the programme. The number of listeners has now risen since 1997, with the overwhelming majority of the Afghan population (including refugees in neighbouring countries) listening in one or both languages.

The success of the soap opera owes much to its use of needs analysis, based on techniques of participatory rural appraisal, which keeps it close to the everyday problems of its listeners’ lives. Needs analysis also reveals the kinds of misinformation and dangerous practices, which can be countered through the radio programmes.

Unlike many soap operas in the world, NHNL began to reflect the changing world situation in its output within two weeks of the events of 11 September 2001. As political events developed, it quickly became clear that there was a huge humanitarian crisis in the making in Afghanistan, and that the audience’s need for help and advice from a trusted source was greater than ever before.

The programme staff in Peshawar could draw on their personal experiences to anticipate the mass population
movements, which began even before the American bombing campaign in Afghanistan. They were, therefore, well placed to develop practical messages to support and help their audience, such as the importance of taking all documents with them if they fled their homes, the need to keep families together, mines awareness for people moving into foreign terrain, and conservation of food and water supplies. Most importantly AEP also encouraged debate about whether leaving homes and land could be more dangerous than staying behind.

All of these messages began to be incorporated into the soap opera by the beginning of October. Scenes in the programme involved families who arrived in both villages of NHNL, having fled their homes in panic from fear of bombing. These scenes became the vehicle for putting over the kind of practical humanitarian advice needed by Afghan audiences. Initial features developed in response to these contacts included mental health issues, post-traumatic shock syndrome (especially in children), practical information about mines and the need to behave safely, what is needed in an emergency kit, how to build a latrine and sanitation advice.

The overthrow of the Taliban regime made it possible for BBC-AEP to be repatriated to Kabul in October 2002. With its huge following, proven audience impact, use of accessible language and experience of working very closely with its audiences, NHNL remains as a powerful tool for the grassroots reconstruction of Afghanistan.

The experience gained by BBC-AEP in running its REACH programme for school-age children provides the basis on which the team can plan further educational broadcasts both to support schools and for the large numbers of children outside formal education. The team has identified four audiences as priorities: teachers, medical personnel, farmers and women. They also have a role in capacity-building in radio techniques where they have unparalleled experience in successfully training teams of Afghan broadcasters to a very high standard, including training people with no previous broadcasting or journalistic experience.

Constraints on ICT use

The constraints on ICT use are obvious and severe: a poor, mountainous country with a low density of population and a limited, partly destroyed, communications infrastructure. Along with these practical constraints are educational and linguistic ones. Afghanistan is short of schools and its workforce has a limited background education. If it is proposed to make materials available in the two most common mother tongues, then they will need to be developed or translated, once problems of presenting the script on a screen have been overcome.

Analysis

Afghanistan presents in a severe form the questions facing any of the least-developed countries in implementing a policy for the use of communications to support education and training. It will need to decide at what level in the education and training system any teaching about the technologies themselves should take place. Then, insofar as computer technologies are concerned, it will have to develop a linguistic policy and the emphasis to be placed on local versus international languages.

In broadcasting, experience elsewhere has shown how powerful radio can be in both formal and non-formal education. Given the shortage of trained teachers, radio and print-based distance education may be of particular value for teacher training in Afghanistan; its effectiveness for this purpose has been widely demonstrated elsewhere. The respect in which the BBC’s work is held is a major asset on which to build.
NOTES

1 “An Afghan Perspective on Education: Building on the past for the future” (personal communication, 2001).
5 See note 3 above.
6 See note 3 above.
9 Shirazuddin Siddiqi, “The role of the BBC in the reconstruction of Afghanistan” (unpublished paper, 2003). This section is closely based on Siddiqi.
Central Asia:
Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

ICT USE IN EDUCATION
Mr Hilary Perraton, Ph.D

INTRODUCTION

The five central Asian republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan share a common history and face similar problems in developing and reforming their educational systems. All were formerly within the Soviet Union, attained their independence suddenly in 1991 as a result of the breakup of the Union and are now members of the Commonwealth of Independent States (CIS). Despite many differences between them, it is convenient to look at them as a group. Basic data are set out in Table 1.
These are landlocked countries, dominated by deserts and mountains, and with low densities of population. Economically, the five countries were part of the single Soviet system so that economic planning and decision-making was based on their role within that system. The resulting economic policy might just be defended within a command economy of a colossal state like the Soviet Union, but it was quite unfit to the needs of newly emerging states. Just one illustration is the over-emphasis placed on cotton cultivation, which had a severe environmental impact. There were some bizarre results of the state economy as well: Kazakhstan, for example, was left with a cosmodrome from the heyday of the Soviet space programme.

The development of new economic policies, with implications for education, was complicated by tensions within the region, reaching the level of civil war in Tajikistan, and by the high levels of emigration, especially of middle-class, well-educated Russians, the so-called pieds rouges.

In working through the period of post-Soviet transition, all five countries have had to respond to similar pressures. As one Russian commentator argues:

The all-union “mechanism” was fundamentally different from a self-regulated market economic system, which in this context may be described as an “organism.” The naively criminal attempt to transform the “mechanism” into an “organism” in one stroke by the universal total implantation of a totally new economic system made the destruction of the [former Soviet] united space unavoidable, resulting in economic catastrophe in the CIS countries. The most serious effects were felt not in Russia but in the weaker parts of the “mechanism,” the Central Asian states.¹

Independence thus meant that the new countries had to establish new economic structures and look for new economic links and trading partners, while at the same time seeking to establish their national identity and culture. Economics, culture, history and religion all had potential roles to play in transformation. For practical reasons, Central Asia soon began again to look to Russia; for reasons of history, language and culture countries they looked to Iran and Turkey; for religious reasons they looked to the rich Islamic states to the south; and as part of the move away from communism they looked to the West. Uzbekistan, for example, established new links with Turkey, Vietnam, India, France and the United States and succeeded in establishing

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joint economic projects with China and, in principle, with Pakistan. Perhaps as significant, after earlier disputes, it re-established economic links with Russia.²

This reaching out may have begun a process of economic change to match the political transformation, but it has had limited short-term success. The CIS has proved a weak organisation and does not have the capacity to promote major economic change or co-operation. “The cousins of the Central Asian people in Turkey and Iran proved too weak economically to serve as locomotives of development, the brethren-in-faith in the rich Arab countries were in no hurry to share their wealth with remote northern relatives, and the West and the Asian tigers preferred to invest only in lucrative enterprises such as mining, metallurgy, telecommunications and car assembly plants.”³

One part of the solution to the region’s economic problems may lie in co-operation within the region, leaving politicians with the demanding task of promoting at one and the same time regional co-operation and a new national identity. But there are no simple answers to questions about the culture, the politics and the economics which the education system should serve, or about the framework within which educational decisions are to be taken. Decisions about language, for example, are fundamental to education and reflect the complexities of the region. Kazakh, as one illustration, was originally written in Arabic script which was replaced by a modified form of the Roman alphabet in 1930, only to switch to Cyrillic 10 years later. Kazakhstan is reported to have switched again, back to the Latin alphabet, but has applied this policy unevenly. “The difficulties experienced in establishing new alphabets may be seen as metaphors for the obstacles that pave the way for Central Asia as it attempts to define its new position, resolutely modern and freed from the constraints of the old Russian tutelage.”⁴

It is not surprising that poverty dominates. The Economist reports how the whole region got poorer after the collapse of the Soviet Union. More than 80 per cent of the population fall below the official poverty line in Tajikistan and 17 per cent live on less than US$ 1 a day. The proportion of poor people in Kyrgyzstan hovers around 50 per cent. In Kazakhstan as a whole, nearly 25 per cent of the population are below the poverty line, while on the shores of the Caspian Sea the figure rises to 95 per cent.⁵

Despite all that they have in common, the differences between the countries are striking. Kazakhstan, the richest country in the region, is huge, the fourth-largest country within Eurasia, exceeded in area only by Russia, China and India. Much of it is semi-arid steppe but with important industrial areas in the northeast, where industry was most easily integrated with the rest of the Soviet Union. It has reserves of oil and natural gas, which made up over a quarter of GDP in 2001. Kazakhstan is described as multi-ethnic, with Kazakhs forming a plurality but not a majority of the population.

Kyrgyzstan and Tajikistan are smaller and poorer mountainous countries with limited mineral resources. Agriculture is still a dominant feature of the economy in Kyrgyzstan while Tajikistan was the least industrialised of the Soviet republics. Both countries export labour to Russia and Kazakhstan. They have high levels of debt and dependence on foreign aid. Tajikistan is still recovering from its civil war with a reported 100,000 dead and 700,000 homeless.

Turkmenistan is dominated by desert, with a small population and a low density of population. Its oil and gas reserves make it relatively wealthy within the region. Like Kazakhstan it has a relatively high rate of urbanisation. In Uzbekistan, in contrast, the primary sector is dominated by the rural population and only 38 per cent of the population is urbanised. It is self-sufficient in natural gas, has some mineral reserves and a significant industrial sector.

The five countries’ Soviet inheritance means that all have a well-established educational system with high levels of literacy and high enrolment ratios at all levels. Central Asian education benefited both from an ideological commitment to raise the standard of education and from the relatively high proportion of GNP spent on education in the Soviet period.

Upon independence, the countries responded in a similar way in restructuring education. All of them reduced the length of compulsory education from 11 to nine years, allowed private education, sought to use local languages as the medium of instruction and began introducing fees, particularly for higher education. All also tried, with varying success, to decentralise educational decision-making, although in some cases this policy was rapidly reversed.⁶ The countries now share a similar educational structure with 10 years of schooling organised in a 3 + 5 + 2 structure with a three-year primary cycle, followed by a five-year junior-secondary cycle and a two-year upper-secondary cycle, sometimes provided in a number of different types of school. Uzbekistan is now moving to 12 years of compulsory education, with the final three years either academic or professional.

The figures show that there have been declines in enrolment at most levels of education since transition. UNICEF comments, for example, that the situation in Kyrgyzstan “appears particularly alarming, with significant falls apparently taking place in enrolment rates at the primary level, as well as at lower-secondary level. Taking both levels together, the data appear to show that about one in seven children of compulsory age are not enrolled in school in several countries in Central Asia.”⁷ And a conclusion drawn by International Institute for Educational Planning (IIEP) eight years ago still seems to hold true: “Social demand for education, which was previously guaranteed by the state and satisfied at all levels of education except higher, but including continuing and non-formal education, can no
longer be met due to the economic and financial stringency of the transition period.”

**National policies, strategies and programmes**

Strategies can be distinguished at two levels: for the CIS as a whole, of which these states are members, and for the five separate countries. It is useful to examine how far policies have been adopted for the communications sector generally, and for information and communication technologies (ICTs) within education.

On the dissolution of the Soviet Union, the CIS countries agreed to share information technology resources relevant to research and education developed within the Union or among the member countries. Agreement was reached in 1992 between Azerbaijan, Russia, Armenia, Belarus, Ukraine, Moldova and the five central Asian republics. However, despite all good intentions, 90 per cent of the formal agreements made by the CIS have not been implemented.

A review undertaken by the UNESCO Institute for Information Technologies in Education (IITE) provides some data on policies in four of the countries. (Their review did not include Turkmenistan.) Table 2 reproduces their data. The IITE review did not consider the content of this documentation and it is not possible, therefore, to say how far these policies reflect, and are taken account of within, national policies in relation to ICTs. The picture they give, which is consistent with other information, is of Kazakhstan and Uzbekistan, the richest countries in the group, having gone further than the others in the development of policy. The general emphasis seems to be on secondary (and probably senior secondary) education. Development of curricula has gone ahead. Only in Uzbekistan is there a particular reference to the use of the Internet.

Alongside national policies there have been individual initiatives, many of them launched from outside the region, to promote or support the use of ICTs especially in higher education and for training. In all five countries, for example, an American Internet Access and Training Program (IATP) is aimed at people who have studied in the United States and returned home; it also aims to provide training in ICTs to professional groups that include educators. It runs some training programmes as well as providing access to the Internet (www.iatp.uz/about.htm).

In terms of national policies on broadcasting, the region gives a consistent picture of radio and television remaining dominated by state broadcasting corporations. With the exceptions of external broadcasters, such as the BBC and Voice of America which both have transmitters in Kazakhstan, the radio stations listed in the *World Radio TV*

### Table 2: Government documents on ICTs in education

<table>
<thead>
<tr>
<th>Policies up to 2002</th>
<th>Policies from 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kazakhstan</strong></td>
<td></td>
</tr>
<tr>
<td>- The government standard of information education (grades 7-11). Curriculum on Informatics (7-11 grades).</td>
<td></td>
</tr>
<tr>
<td><strong>Kyrgyzstan</strong></td>
<td></td>
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<tr>
<td>- Curriculum approved by Kyrgyzstan’s Education Ministry.</td>
<td></td>
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<tr>
<td><strong>Tajikistan</strong></td>
<td></td>
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<tr>
<td>- Official statement ordering the analysis of ICT efficiency in education, approved by the Education Ministry and the Academy of Sciences.</td>
<td></td>
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<tr>
<td><strong>Uzbekistan</strong></td>
<td></td>
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<tr>
<td>- The Computer and Information Technologies Programme for 2001–05, aiming to provide extensive access to the Internet.</td>
<td></td>
</tr>
</tbody>
</table>

Handbook 2002 appear to be entirely state broadcasters, although this may conceal a measure of privatisation. The same picture emerges in relation to television, although in much of the region there are also relays from Russia, Turkey and Iran. Post-Soviet transformation appears to have produced only partial shifts away from government control. Internews, an Internet news service funded by USAID, reports that in Kyrgyzstan a widening of ownership of stations in the 1990s was followed by a narrowing and a concentration in the hands of those close to government.10

There have, however, been some moves towards using television for informal education about the values of the new society. Building on the strengths of Kazakh cinema, a Kazakh-British co-production Crossroads (Kavusushi in Kazak) has attracted large audiences for programmes that look at the problems of working in the new style economy, and successfully fought the competition from Russian and American sitcoms.11

In Uzbekistan plans are underway for a series of radio dramas, the Silk-Road Radio Soap, which will address issues of health, agriculture and contemporary national issues. (UNESCO, in reporting on it, carefully avoids saying whether it will address trickier issues including AIDS and politics.) The programmes are apparently made in both Uzbek and Tajik and for use in Uzbekistan and Tajikistan (www.unesco.org/bangkok/education/ict).

The continuing public control of broadcasting gives countries the means, if they have the will and can find the finances, to use broadcasting for education.

### Current level of ICT access and use

The IITE survey referred to above makes it possible to summarise the extent to which four countries of the region are using ICTs in the classroom. Although the title of the survey refers to secondary education, the text refers to computer use in schools at all three levels. It is, however, possible that the survey respondents treated the IITE questionnaire inconsistently. With those cautions, the survey gives the picture set out in Table 3.

**Table 3: ICT school use in Central Asia**

<table>
<thead>
<tr>
<th></th>
<th>Kazakhstan</th>
<th>Kyrgyzstan</th>
<th>Tajikistan</th>
<th>Uzbekistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of schools with computer classrooms</td>
<td>100</td>
<td>66</td>
<td>11</td>
<td>46</td>
</tr>
<tr>
<td>Percentage of computers which are IBM or Apple compatible</td>
<td>95</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Students per computer</td>
<td>62</td>
<td>57</td>
<td>48</td>
<td>100</td>
</tr>
<tr>
<td>Percentage of schools with Internet access</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: UNESCO-IITE 2002 diagrams 2,3,4,7

It seems reasonable to assume that Kazakhstan interpreted the enquiry as referring to one group of its schools (possibly those with senior secondary classes only) as the logistics of equipping all its rural schools with computers would be forbidding. The study did not make it possible to distinguish between the use of a single computer for management purposes, and it is possible that some of the computers revealed by this survey were used in the office rather than in the classroom. The survey reports that the majority of Uzbekistan computer classes have programmes for elementary classes and that, where information was supplied, most of the software was developed by domestic specialists.

Reflecting the low densities of population and restricted national telephone systems, the Internet is irrelevant to basic education in Central Asia. Indeed, Kyrgyzstan notes that Internet access has become more difficult than it was since the winding down of a Soros Foundation project which was exploring the potential for the use of the Internet in the region.12

There may be potential to use a range of technologies for the updating or retraining of the teaching force. Distance education techniques have been widely used for this purpose, sometimes in countries in transition like Mongolia and South Africa, though more rarely in the former Soviet bloc. Uzbekistan is developing a distance education programme for secondary teachers within the context of its reform of secondary education. The UNESCO Institute for Information Technologies in Education is reported to be holding a workshop on this topic in Tajikistan in October 2003, which may shed light on the opportunities and constraints.

The picture that emerges is one in which governments, moved perhaps by a quest for post-Soviet modernisation, perhaps by middle-class pressure, perhaps by international enthusiasms for ICTs in education, have been compelled to frame policies and to begin bringing computers or informatics into the curriculum. With the exception of Uzbekistan, and like most of the other CIS states, computers are not expected to be a support for other subjects in the curriculum.13 Rather, they seem to have been used for teaching about ICTs. But they are being used on a very modest scale, probably with cottage-industry software, and often with obsolete hardware. With all the other pressures
on the educational system this is hardly surprising. The relative insignificance of ICTs within the context of educational transformation is symbolised by the fact that the two country papers from Central Asia produced for the International Bureau of Education 2001 biennial conference barely mentioned the technologies in their analysis of the educational problems.

**Major initiatives**

**Computers in Schools in Kyrgyzstan**

Kyrgyzstan’s exploration of the use of computer-based technologies in schools probably reflects experience more generally. As already noted, Kyrgyzstan inherited a sound educational system from the Soviet Union and sees itself as the leading CIS state in the reform of education. As far back as 1995 it developed a national ICT programme which included an educational element, but this was only partially implemented because of shortage of funds. In 1996 the mass computerisation of schools began with funding from the Asian Development Bank with some 100 kits, each with 12 work stations in a local network being provided to schools. Over the next three years, the number of computers in schools expanded as with donations either by foundations or by the private sector. Active steps were taken to expand this process in 2000 with a further 1,450 computers provided with Ministry of Education and foundation funding. It seems, however, that expansion was more rapid between 1996 and 2000 than in the period 2000–2003. The result of this apparently piecemeal development is that in middle and senior secondary schools there is now one computer for every 240 students, but that ratio worsens to only 1:971 if you remove from the equation all the outdated, incompatible Soviet-era computers.

Originally, there were attempts to distribute computers evenly throughout the country, but because of donations and one-off initiatives, distribution has become more random and uneven. Only about 21 schools had Internet connection in April 2003, and the use of the Internet has declined since the end of a Soros Foundation programme that was aiming the use of the Internet for communication and development in the region. There are four main reasons for the restricted development of Internet use: the telecommunications infrastructure is limited, ISPs are not available in rural areas, costs are high and senior staff in schools are not persuaded of its value.

The expansion of computer use in the classroom generally is constrained by a number of factors. First, there is a shortage of teachers with an appropriate specialty. Nor are there technical and support services for schools. There is also a lack of an appropriate qualification structure for these teachers; a training system was included within the ADB project but not funded. In fact, in 2002–03, there were only 1,345 teachers of informatics in 2,029 schools which included 1,694 middle schools. Meanwhile few teaching materials are available in Kyrgyz and available software, for example about programming and algorithms, does not match the demand.

The Kyrgyz government now does have programmes which it would like to see developed in 2003–07 but these are dependent on funding. It would like to put 7,000 computers into schools, but at US$ 500 per computer this would require US$ 3.5 million for the computer hardware alone. Access to the Internet would require considerable recurrent expenditure, on top of that required for other uses of computers, estimated at US$ 1.2 million per annum if 1,700 schools were connected.

A project for an educational management information system appears to be making only slow progress. A review, conducted under the auspices of UNDP, sets out priorities for developing the country’s information technology outside the schools. In considering human resource development it argues for the need of the systematic education of senior government officials, improving educational management systems and the development of an Internet educational portal. By implication these moves are needed earlier in developing national readiness for the wider use of the technologies than school-based programmes.

Two general conclusions follow from Kyrgyzstan’s experience and appear to be reflected elsewhere in the region. First, the use of computers in schools has been heavily dependent on external funding so that the pace of change has in part been a function of aid policies of agencies like the Soros Foundation and the Asia Development Bank. (This may well be a contrast with the educational use of older media such as radio.) Second, some early developments relied on hardware and software that were incompatible with the international standards which market forces have more recently been imposing. Old Soviet computers and software to teach programming skills do not fit with demands from learners or employers today.

**Distance Education in Kazakhstan**

The government of Kazakhstan, in co-operation with the UNESCO Institute for Information Technologies in Education, has set up a pilot project of distance education for middle schools. The project was launched in 2001 with six schools in two districts of the country. It is now reported to involve 68 schools in the western district, 43 schools in the eastern district and 326 schools in the Pavlodar district in the more industrialised northeast of the country. The project has required the installation of some five to 10 computers in each school together with lecture rooms equipped with television. It appears to be designed, at least in part, for real-time interaction with specialist teachers, although it also looks ahead to tapping resources from Moscow through the Internet.
Backwards and Forwards with the Internet in Uzbekistan

The UNDP began supporting Internet development in Uzbekistan in 1996 and continued to do so for some years, alongside other donors. The Internet was, however, seen by some politicians as a potential threat. This led the government in 1999 to make the state-owned operator of the national data communication network the sole operator of the national network with a monopoly on access to the Internet backbone. Funding agencies, including the Soros Foundation and USAID, withdrew their support. UNDP has, however, continued to work and has work in hand which includes training about ICTs for those working in small and medium enterprises.18

But politics changes priorities and USAID has come back into Uzbekistan with a set of projects which includes the Internet Access and Training Programme (IATP) referred to above and a “computers for schools” project. This project is run by an American non-governmental organisation (NGO) IREX (International Research and Exchanges Board) and has installed an average of 10 personal computers in each of about 100 primary and secondary schools throughout Uzbekistan, with funding from USAID which has a new priority “on education and youth in Central Asia.” IREX reports that when the computers are fully deployed, 10,000 students a day will have access to the Internet (www.irex.org/programs/uxc/index.asp). While their website reports do not discuss the aims of the project beyond a general concern with fostering democracy and internationalising education, the reference to the Internet suggests that connectivity, probably alongside teaching of informatics rather than the use of computers within the curriculum, is central to the project.

Public Education and Information through the Internet in Tajikistan

Despite the technical constraints, agencies are beginning to use the Internet for public education in Central Asia. In Tajikistan, for example, IATP has put on its server a website about tuberculosis, which is a major health problem in the country. The site was created by five medical professionals in Dushanbe and was initially designed to provide information to the medical profession (http://irex-tj.org/~dots). IATP report that, “The participants initially created a Russian-language version of the website because Russian is universally understood by doctors in Tajikistan and the Eurasian medical community at large. Plans are underway to translate the website into Tajik, a difficult task given the lack of medical terms in the Tajik language, but an important one for making the information more accessible to patients. The committed group of participants continues to work on the project, planning to add information about the treatment facilities of various hospitals and links to relevant web resources. As treatment methods advance, so will the website.” (www.irex.org/programs/iatp/news/2003/01003-ca.asp#web).

The University of Central Asia

The university has been established by the Aga Khan Foundation and has its first campus at Khorog in Tajikistan. It plans to open campuses in Kyrgyzstan and Kazakhstan. The university’s main purpose is to provide education relevant to the needs of mountain people so that the theme of development in high mountain areas is central to its work. Alongside its degree-level work the university has, from its initial planning, also been interested in the development of community education. Taking account of the scattered nature of its audience it is also committed to the use of appropriate distance education technologies and has been exploring what these should be. While the university is only in its early days, it could become of major significance not only for the courses it is running but also for its exploration of their methodologies.

Soap Opera in Tajikistan and Uzbekistan

As noted briefly above, a Silk-Road Radio Soap builds on regional traditions of storytelling to discuss current issues in a twice-weekly radio drama series, produced and transmitted in Uzbeki and Tajik. The programmes are externally funded and have had support from UNFPA, UNESCO, UNODCCP and UNHCR together with the British government. Some 200 episodes have been completed and a comic-strip version is published in Tajikistan and Uzbekistan. Studio and airtime are provided free by Tajikistan and Uzbekistan.

Evaluation reports on the series have not been located, but UNESCO notes that:

The themes dealt with in the radio dramas can be grouped in three categories, in accordance with the priority areas of the main funding agencies: family and reproductive health, agricultural themes and contemporary national issues such as humane and considerate treatment of displaced and underprivileged groups in society, ethnic harmony and tolerance in society and trafficking of women. New themes are constantly surfacing, in the light of ongoing needs assessment, consultation with stakeholders and audience research. These are incorporated in the radio drama storylines and scripts, through existing and developing characters and scenarios. In this way, the Silk-Road Radio Soap continues to be a medium for effective contemporary education, while also drawing attention to current, topical issues (www.unescobkk.org/education/ict/v2/info.asp?id=14355).
Constraints on ICT use

The major constraints on ICT use in these countries follow from their economics, their geography and their history, discussed briefly above. Assessments of e-readiness make it clear that the countries face major difficulties which need to be overcome in hardware, software and training in seeking to expand the information technology sector in the economy. Constraints on educational use inevitably follow.

There are also potential constraints arising from questions of language and of alphabet. These are not likely to be serious at the higher levels of education, provided Russian or English is used. These remain the dominant languages of international trade and are apparently widely used in the government and private sector within the region, so language may not be a constraint on the use of the technologies in training and in relation to employment. Any proposals to use computer-based ICTs with small children or for non-formal education – which might well fall on other grounds – would need to take this into account. But any move to the increased use of national and local languages, rather than Russian or English, adds another layer of problems to computer-based activities.

Analysis

The development of the use of the technologies in education needs to be seen in the context of the process of transition which has dominated Central Asia over the last decade. The reduction in funding for education, which followed the collapse of the Soviet Union, has meant that educational innovations of many kinds have depended on external funding. A partial dependence on Moscow and on the richer parts of the former Union has been replaced by a reliance on the shifting policies of the aid agencies. External funding is, for example, a dominant theme in each of the illustrative projects discussed above. The evidence also suggests that a number of the agencies have moved away from an earlier interest in the use of computer-based technologies in school. The Asian Development Bank and the Soros Foundation, for example, have previously funded work in these areas but are no longer doing so. The Aga Khan Foundation, which funded early work on the use of computers in schools, in Kenya for example, does not appear to have this as a priority today. With the exception of the Silk-Road radio project, there does not seem to have been external support, or dramatic endogenous interest, in the use of radio despite its technical advantages for a region. With GNP per capita of less than US$ 1000 in four of these countries, the expansion of the use of ICTs in education looks as if it will remain dependent on external support.

That support in turn will depend on achieving clarity of purpose which does not seem to be present in much of the reported thinking and discussion from the region. Accounts of the use of computers in school, for example, do not specify why this is seen as desirable. Insofar as one can infer from the documentation, computers are seen as desirable in some cases in order to teach informatics, in others to allow access to the Internet. In contrast, there is little discussion of their use within the curriculum more generally, or within the process of educational reform, or simply for children to acquire basic skills in word processing or the use of spreadsheets. One consequence is that the shortage of specialist teachers of informatics is seen as a major constraint on development. A further consequence is that there seems to have been little informed discussion about the level in the educational system at which it makes sense to invest in the technologies or the extent to which vocationally oriented education in this area belongs properly to the publicly funded sector of education, or the publicly or privately funded training sectors.

Generally, Central Asia gives the understandable impression of being outside the mainstream of thinking about the roles of the technologies in education and distance education. The CIS republics, including Russia itself, rejected the Soviet Union traditions of distance education, which were overly dependent on print but had solid achievements to their credit and had worked out firm links between education or training and employment. But, having abandoned those approaches, at least some of the new thinking about distance education, as in the schools project in Kazakhstan, seems to be based on assumptions about the value of real-time, technology-based teaching at school level and of the use of master teachers in the television or computer classroom – a model which has been severely criticised and often failed to survive where it has been tried elsewhere. Other plans, including those for higher education in the region, are dominated by discussion about high-technology approaches in contrast to those widely used in, for example, the major Asian open universities. For poor and remote countries which have abandoned the educational traditions and practices of over half a century, there is a real danger of adopting currently fashionable approaches in a hurry.

What is needed is hard-headed analysis of the case for and against using the technologies in education backed by a critical analysis of successful and unsuccessful experience elsewhere. The encouraging feature of the literature from Ministries of Education in these countries is their apparent scepticism about the technologies and their proper concentration on the important jobs of improving and expanding education.

Two gaps: First, there is little here about the use of computers to help in the management of schools or of educational systems, and of their significance in any decentralisation of education. Second, again, radio seems a medium which was seen as powerful in the Soviet period, but which would seem from the literature to be suffering comparative neglect today.
NOTES

1 A.M. Vassiliev, Central Asia: Political and economic challenges in the post-Soviet era (London: Saqi, 2001), 16.
3 See note 1 above, p. 271.
4 Jean Radvani in Capisani. See note 2 above, pp. xi-xii.
8 See note 6 above, p. 9.
9 See note 1 above, p. 26.
11 See note 2 above, p. 68.
15 This account is based on National Commission for UNESCO, Kyrgyzstan 2003. See note 12 above.
19 See note 16 above.
INTRODUCTION

Iran has a population of 64 million with a growth rate of 1.7 per cent. Its people represent a variety of ethnic origins including Par, Turk (Azerbaijani), Kurd, Lore, Armani (protestants), Arab, Baluch and Turkmen. Forty-one million live in urban areas and 23 million in rural areas.

The literacy rate is more than 96 per cent and education is mandatory through high school. There are currently approximately 18 million students in the school system, which includes both public and private schools.
The government controls over 80 per cent of the economy and has a gross domestic product (GDP) of more than US$ 120 billion. Exports of raw oil, petrochemicals and carpets amount to about US$ 20 billion.

National policies, strategies and programmes

No clear national information and communication technologies (ICTs) strategy has been developed, although many governmental entities are responsible for developing policies and strategies. The oldest of these entities is the High Council of Informatics, established after the Iran Revolution to systemise information technologies (IT) and ICT activities. Its primary role is to assess and classify IT enterprises and supervise software development activities.

Another entity is the National ICT Agency (NICTA), which is led by the President of Iran, H.E. Khatami. It has the overall responsibility for ICT initiatives in the country. The structure and sectors of focus for NICTA are illustrated in Figure 1. NICTA is responsible for designing and managing the Application Plan of Information and Communication Technology (TAKFA), which is the overarching ICT development plan for Iran.

Figure 1: Structure and areas of focus for NICTA

Although NICTA is very important to the support of ICT, it has not established policies and strategies for using ICT in Iran. This task will fall to the High Council of IT, a Board of the Post, Telephone and Telegraph Ministry (PTT – see www.iranict.org).

Further, the Iran Informatics Companies Association (IRICA) was formed in 1944 with the primary objective of being a catalyst for the growth of the ICT industry. IRICA is a non-governmental, not-for-profit organisation, financed mainly by the annual payments of its 600 members.

While Iran has not yet developed policy and strategies, over the past two years there has been a big increase in activities and initiatives for decreasing the ICT gap. For example, the following laws and regulations have been put in place:

- A copyright law (although it does not yet protect foreign intellectual property, but this is to change soon).
- Protections and guarantees regarding foreign investment.
- Easier and more suitable methods for awarding contracts.
- A regulation that states that all national projects must be awarded to consortiums of Iranian and foreign companies.

The Information and Communication Technology Application programme (TAKFA) is, at this point, the most important policy initiative for Iran. Its mission is to foster the development of a knowledge-based economy by achieving the following objectives:

- Creating infrastructure (network, law and security) for Iran’s information and communications development.
- Compiling and applying a comprehensive system of communications and information.
- Developing productive employment.
- Promoting the development of ICT skills at both individual and institutional levels.
- Implementing flagship projects.

A number of plans are to be developed to guide the pursuit of these objectives:

- A plan for electronic government (system, virtual network, law and security).
- A plan for promoting ICT application in education and expanding digital skills in Iran’s manpower.
- A plan for expanding ICT in higher education.
- A plan for expanding ICT in health, treatment and medical education.
A plan for expanding ICT in economy, commerce and trade.

A plan for expanding the culture and knowledge of ICT, and for strengthening the Persian script and language in the computer environment.

A plan for expanding active SME in ICT by creating growth centres and ICT parks.

A number of initiatives will be undertaken to execute these plans. Those most relevant to the education sector are the following:

- Developing a science network (universities and research institutes).
- Developing a growth network (Ministry of Education’s schools).
- Creating a national information portal (i.e., creation of a web for all executive bodies and dissemination of relevant information through such a web).
- Developing ICT in schools.
- Creating digital libraries.
- Developing remote control medical services.

The main activities of TAKFA that will affect education are:

- The application of ICT in schools and workforce development (at primary and secondary schools as well as vocational training institutes).
- The application of ICT in higher education (Medicine, Engineering, Social Sciences, Arts, etc.).
- The development of ICT in cultural issues (Farsi writing and usage, art, culture, etc.).

In all, a total of 1,650 projects have been officially submitted to the SCICT with a total value of over US$ 2.7 billion. Most of them are for consultancy, concept development and feasibility studies, creating infrastructures in organisations, completion of projects defined in the past and human resource development.

Current level of ICT access and use

The governmental partners in Iranian education include the following:

- Ministry of Education
- Vocational Training Institute
- Tehran Technical Training Institute
- Electronic Education Committee of TAKFA
- Iran National Radio and TV
- Private sector organisations offering computer training

The most widely used ICTs are multimedia CD-Roms, web portals, electronic support of traditional curricula (PowerPoint presentations, etc.) and online newsgroups.

- The Ministry of Education has plans to develop ICT applications in primary and secondary education. Currently, 6,500 of Iran’s 15,000 secondary schools have computer sites, and by 2006 all of the rest will as well. The Growth Network is the ministry’s plan for establishing ICT facilities in schools. Guidelines for the Growth Network include research and development, putting hardware and Internet connectivity in place, developing educational materials and providing training for people in the education sector.

- The Vocational Training Institute has a few courses on IT and ICT; however, its equipment is not adequate.

- The Tehran Technical Training Institute provides training leading to the Microsoft Certificate of System Engineering (MCSE).

- The Electronic Education Committee of TAKFA is responsible for expanding the use of ICT in education by continuing to manage the progress of projects, conducting seminars to develop ICT expertise, identifying appropriate educational models and establishing a digital education database. They continue to develop education software products (all CD-Roms), with 25 products in 2000 increasing to 100 in 2002.

- The Iran National Radio and TV offers the Education Channel, which offers many programmes in the realm of IT-related subjects ranging from how to use various software to scientific shows and documentaries. There is also a radio station, the Education Station, which offers similar programmes. The other effective public broadcasting medium is the teletext provided by TV channels 2 (Farsi version) and 3 (English version). It offers a wide variety of information that is periodically updated, as well as daily information on topical matters.

- The private sector offers computer training in labs certified by the Ministry of Jobs and Social Insurance. These are the centre of IT-related training. They have formed their own association, the Computer Lab Heads.
Based on the latest statistics available, 1,100 computer labs are currently active in the region (see www.isaci.com).

Because of the widespread disregard of copyright, there has not been much motivation for the production of educational software; however, it appears this may change. In recent years, the High Council of Informatics has defined copyright for Iranian software products; the challenge now is to apply the law.

In computer literacy and use of computers there is no difference between genders. However, Islamic rules for boys and girls still apply to some extent. Also in rural areas and small cities there are doubts and worries about using computers, especially regarding the World Wide Web and the concern that it may be used to access materials that are inappropriate in terms of Islamic rules.

Major initiatives

- **The Ministry of Education** has initiated an Electronic School Plan in 10 schools that facilitates the use of computers and provides training for teachers and learners.
- **Pardis Technology Park** is located in Pardis area in the northeast of the capital city of Tehran. It plans to provide a range of services including ICT services; training and education; consulting, investing and marketing; banking, financing and insurance; and laboratory and workshop facilities.
- **SchoolNet** was established with the support of the Science and Arts Foundation (SAF) and Sharif University of Technology. SchoolNet makes it possible for schools and cultural institutions to connect to the Internet. Moreover the central intranet at SchoolNet facilitates access to the educational resources on the web and provides a portal to interact with the users.
- **The Vocational Training Institute** has established seven centres for ICT education. This number will be increased to 30 by 2004. In March 2003, departments of this institute were equipped with a computer site.
- **The Electronic Education Committee of TAKFA** recently held an electronic education seminar in Tehran that brought together experienced specialists and technologists to brainstorm about both the literature and the perspective of e-learning. A number of papers were presented and some workshops were held.
- **The website www.irankids.com** provides services to children that include training in areas such as science, arithmetic, safety, art and music; entertainment such as proverbs, comics, jokes, picture galleries and computer games; parental training such as nutrition for kids, how to “tech” your kid and how to behave towards your kids; an Internet school for Iranian children; and a news board for kids.

Examples of training

- The Vocational Training Institute has established ICT courses for 3,000 teachers.
- All governmental staff must take a 130-hour course on MS Office and ICT concepts.
- Seventy thousand teachers of the Ministry of Education have passed ICDL courses. The content of these courses includes general IT information, introduction to OS and working with files, word processing, electronic presentation, spreadsheets, databases, Internet and mail and using search engines.

Constraints on the use of ICT

**Ministry of Education constraints**

The current constraints on the use of ICT in education are as follows:

- The private sector computer training institutes that provide ICT training do not meet any standards.
- There is little emphasis on ICT skill development strategy in vocational and educational departments.
- There is no distinct national standard for e-learning.
- There is a lack of knowledge of copyright law, and its application, which creates an insecure environment for those in charge of e-learning.
- There are no standards among the large number of unauthorised computer training labs. There is a need to establish a centre to observe and evaluate the function of computer training labs.
There is a lack of evaluation of the efficiency and effectiveness of current e-learning activities.

There is no distinct programme to develop ICT at the primary and secondary levels.

Strategies from other countries have been copied with no cultural adaptation.

ICT has been used in teaching without changing previous traditional infrastructure and practices.

There is a lack of information for parents about the use of ICT in teaching.

**Governmental Constraints**

The lack of a national e-learning strategy has led to isolated projects and variance in quality.

Students have little access to computers and TV.

Low bandwidth leads to a sharp decrease of data transfer in Internet services.

Telecommunication infrastructure for connecting schools to the national intranet is not satisfactory.

There is a lack of experienced trainers in ICT.

There is an unsatisfactory level of expertise in Farsi among students in regions that have certain dialects and/or different languages (e.g., W. Azerbaijan, E. Azerbaijan, Zanjan, Ardabil, Kermanshah, Kordistan, Sistan and Balouchestan).

Schools do not have lines that enable Internet connectivity.

There is a lack of Farsi applications and script problems.

There is a lack of strong and integrated management for the development of ICT for the country.

ICT projects are granted to governmental corporations.

There are a number of different decision-making bodies without distinguishing role descriptions.

There is a lack of IT infrastructure in the society generally and especially in primary and secondary schools. The lack of computer labs and local network access plus poor Internet connectivity are the basic difficulties.

**Analysis**

The following are proposed strategies to improve and develop the use of ICT in the educational system:

- Develop and promulgate a national strategic plan for e-learning that is appropriate for primary, secondary and high schools, as well as vocational training centres. (This item is on the duty list of the High Council of Informatics – e-learning committee.)

- Train specialist teachers to develop ICT teaching in schools.

- Train ICT specialists in the Education Department.

- Introduce school principals to the use of ICT and help them develop a supporting school culture.

- Develop a vision for education that is based on lifelong learning.

- Hold training seminars to introduce families to the use of ICT in teaching.

- Activate parent-teacher associations to support the use of ICT in teaching.

- Activate city councils to act like a facilitator to develop the use of ICT in teaching.

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- www.irandoc.ac.ir — The website of IRANDOC, whose main work is research, training and information service. Research on information science, as part of IRANDOC mission, is carried out by research units. These units work on library and information, information analysis, information systems management, terminology and thesauri and information technology. IRANDOC is also the secretariat and a member of National Research Council of I.R. of Iran, and represents Iran in ASTINFO (a UNESCO-supported regional network for the exchange of information and experience in science and technology in Asia and the Pacific).
- www.irict.org — Ministry of PTT. This website introduces readers to the use of ICT for development and has gathered some useful links.
- www.shci.ir
- www.irankids.com
- www.techpark.com
- www.iran-ict.org — Iran’s National Information and Communication Technology Agenda; Regulation of Internet Connection Provider (ICP).
- www.schoolnet.ir — This site provides detailed information about the objectives and programmes of SchoolNet Iran.
- www.sanaray.com — The website of Sanaray Corporation, which is a consortium that was established in 1998 when a number of major Iranian software companies came together, based on recommendations from the Iranian government authorities.
- www.irica.com — The Iran Informatics Companies Association (IRICA) was formed in 1944 with the primary objective of being a catalyst for the growth of the ICT industry in Iran.
INTRODUCTION

As a large country, with GDP per capita below US$ 400 and a limited telecommunications infrastructure, Pakistan is severely constrained in developing the use of the new technologies in education. It is clear from the data in Table 1 that Pakistan is far from achieving basic education for all; the need to expand primary and secondary education, and raise its quality, are priorities which take precedence over proposals to expand the use of information and communication technology in education.
National policies, strategies and programmes

Pakistan has recently adopted an Education Sector Reforms Action Plan which proposes to increase the level of public expenditure on education and, along with other reform measures, to decentralise and to encourage public-private partnership in education. This follows a recognition that nearly 27 per cent of all school enrolment is through private-sector institutions of which there are some 36,000.

Like other large, poor countries, Pakistan has an advanced industrial sector alongside its large rural and agrarian sector. As a result, while on a smaller scale than India, Pakistan has a computer software industry and has attracted work from major international companies in this area. It has launched a communications satellite and with it public discussion of its use for education. As well, alongside its well-established open university it has now set up a virtual university. At the same time, it is reported to be hampered in some computer uses by the lack of an agreed typographical style for Urdu and to benefit from the widespread use of English in government and business. These contrasts provide the backdrop for its policy development.

Pakistan has developed a formal policy and action plan for information and communication technologies (ICTs). Reflecting the country’s adoption of neoliberal policies, the guiding theme is stated to be that government shall be the facilitator and enabler to encourage the private sector to drive the development in ICT and telecommunications. This is in line with earlier decisions to privatise telecommunications even though they proved problematic (e.g., a decision to privatise Pakistan Telecommunication in 1994 had still not been implemented five years later). The major features of the policy are to encourage the development of a workforce with information technology skills, to provide a simple regulatory and enabling legal framework and to promote the use of information technology within both the private and public sectors. (A summary of the policy and accompanying action plan is available at www.unescobkk.org.)

The national policy and action plan argues for the development of a separate and more fully developed plan for the educational use of the technologies, but itself includes proposals for human resource development, information technology education and information technology training, emphasising the need to develop a skilled workforce. To this end it is proposed to expand training and education at postsecondary and higher education levels. At school level it is recommended that information technology literacy should be included in the curriculum of high schools, but the policy makes no recommendation about its role at other levels of the school system or in teacher training. It recommends that all graduates should become computer literate.

In relation to broadcasting, one recent survey reports that Pakistan has no national media policy with television programming governed by directives from the relevant ministry from time to time. At the same time, in contrast with its liberalisation of the economy, the government of Nawaz Sharif in 1997 increased its control over and restrictions on television programming in order to bring it closer in line with Islamic values and to impose a strict dress code on presenters.

Current level of ICT use

As one might expect, the role of the technologies appears to be low in priority for national educational policies at either school or the higher-education level. The Pakistan country paper for the 2001 International Bureau of Education biennial conference made only passing reference to the technologies, and did so mainly in relation to...
management and in the context of decentralisation. Similarly, the 2002 “Report of the Taskforce on the Improvement of Higher Education” made little reference to the technologies and clearly did not see them as being the vehicle for university reform or expansion.

In sympathy with – indeed antedating – the ICT national policy and action plan, some provincial Ministries of Education have introduced computer studies into the high school curriculum, though with limited success: only eight per cent of college students in Karachi chose information technology as a subject for higher school certificate in 2003. An estimate in May 2003 put the number of computers in schools within the range 50,000 to 200,000; the same report referred to plans for a Pakistan Education Network which would provide connectivity to 60 universities initially and eventually to some thousands of primary and secondary schools.6

Similarly, over the years, there have been a number of experimental projects to encourage computer education in schools. The Pakistan Association for Computer Education in Schools, for example, reports on a computer literacy project in schools in 1985 and on “running programmes to spread computer literacy to the younger generation” with 100 computers in 50 schools from 1985–1990.7 A Computer Literacy in Pakistan Schools (CLIPS) project covered 150 schools from 1991–1995, while a follow-up project recommended to the Sindh Ministry of Education in 1997 was not funded.

Other modest one-off developments are reported such as discovery centres, including computers for school children, set up in Karachi and Lahore. In 2000, following its support for private-public partnerships, the government began an information technology programme to encourage private companies to put computer equipment into public schools, provide students with access to computer classes at a fee, and/or provide information technology classes to the community. The programme is intended to be self-supporting and over 4,000 schools have been equipped with computer labs.8

There is a history of expectation of the use of public-service broadcasting on a significant scale in education, including non-formal education, because of its power and its national coverage.

In a country where the literacy rate is only 37 per cent and where only 30 per cent of the total population are urban dwellers, the role of national television as a public service is immensely important. Islam is not the only driving force behind television programming in Pakistan; the preservation and promotion of eastern culture, with its traditional family system, the battle against crime, drugs and child abuse, together with the creation of awareness in health, family planning, environmental issues, are all important...Radio and television reach people in larger numbers than all newspapers and magazines combined [whose readership]...is less than 10 per cent of the population, while television is viewed by about 35 million people on about four million sets.9

Achievement has not always matched promise. The Pakistan Government established an educational channel some 10 years ago, influenced by this kind of consideration as well as by the needs of the formal education sector, with reported funding of US$ 100 million from the Japanese government.10 Earlier this year there was a press announcement that Pakistan was to launch a 24-hour ETV channel in association with an institution based in Manila (www.oneworld.net/article/search). But the quality of the existing educational programmes, whether from the educational channel or from Allama Iqbal Open University, attracts criticism. Hoodbhoy argues that the educational programmes of both institutions are few in number and unacceptable in quality.11

In assessing the significance of the national television networks in Pakistan, it is necessary to note that a growing number of viewers now have access to satellite programmes including those of Star which was launched in 1991. So far, and with the partial exception of the BBC, there has been limited activity by the major international broadcasters in education.

**Major initiatives**

Pakistan has long experience of using information technologies, especially broadcasting, to support the work of what are described as “nation-building agencies.” Education and extension broadcasting is well established. The technologies have, too, been part of the armoury of the Allama Iqbal Open University, established in 1974, which from its foundation has had a responsibility for public education at various levels and not simply for providing degree courses. Over the years it has, for example, used radio along with its other teaching methods in teacher education where its Primary Teachers’ Orientation Course, followed by its Primary Teachers’ Course, have been important mechanisms for the inservice education and professional development of the teaching force. The university has also used distance teaching methods for functional education, offering programmes from basic literacy to electrical wiring. Much of this work has been on an experimental and pilot basis, so that while it has valuably developed and tested methodologies for rural non-formal education, it has not had the mechanisms to tie its work with that of field extension agencies in a way that would allow national replication.12

**Constraints on ICT use**

The major constraints on ICT use are economic and geographical. Pakistan is a large country with a low GNP...
and modestly developed communications infrastructure. At
the same time it contains elements of an advanced
industrialised economy and a consequent demand for a flow
of people able to work with computers in that sector, which
certainly places demands on the training sector and could
be seen as doing so on the education sector.

There are particular constraints on the use of the Internet in
Pakistan reported in a comparative study of Pakistan and
Turkey. As shown in Table 2, Wolcott and Goodman\(^3\)
identified a number of different dimensions of Internet
development and went on to assess Pakistan’s status on each
of these. In their assessment they reported that by late 2000
there had been rapid growth of users of the Internet in the
late 1990s so that, while they showed Pakistan as being level
2, or “nascent,” in its pervasiveness, it might around that
time be moving to level 3, or “established.” Geographical
dispersion was quite limited with rural access in particular
being difficult. As there was Internet activity in all provinces
and in many parts of the country, they rated Pakistan as
highly dispersed.

In a detailed study of interconnectivity they found that
Pakistan lacked a domestic Internet backbone with no
Internet exchange points within the country. Access was
normally by means of dial-up connection. In terms of
organisational infrastructure, the monopoly control of
telecommunications put Pakistan in their level 2 of

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**Table 2: Levels of development of Internet use**

<table>
<thead>
<tr>
<th>Level</th>
<th>Pervasiveness of the Internet</th>
<th>Geographical dispersal</th>
<th>Connectivity infrastructure</th>
<th>Organisational infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-existent: Internet does not exist in viable form in country. Any users obtain connection by international telephone call.</td>
<td>Non-existent: The Internet is not present in this country.</td>
<td>Non-existent: The Internet is not present in this country.</td>
<td>Non-existent: The Internet is not present in this country.</td>
</tr>
<tr>
<td>1</td>
<td>Embryonic: Ratio of Internet users per capita &lt; 1 in 1,000.</td>
<td>Single location: Internet points of presence in one major population centre only.</td>
<td>Thin: Domestic backbone &lt;3 Mbps, international links &lt;129 Kbps, no Internet exchanges.</td>
<td>Single: A single ISP has monopoly.</td>
</tr>
<tr>
<td>2</td>
<td>Nascent: Ratio of Internet users per capita at least 1 in 1,000.</td>
<td>Moderately dispersed: Internet points of presence located in multiple first-level political subdivisions in country.</td>
<td>Expanded: Domestic backbone 3- 200 Mbps, International links 129 Kbps- 45 Mbps, One Internet exchanges.</td>
<td>Controlled: Only a few ISPs with high barriers to entrance to market. All ISPs connect to Internet internationally through monopoly telecoms provider.</td>
</tr>
<tr>
<td>3</td>
<td>Established: Ratio of Internet users per capita at least 1 in 100.</td>
<td>Highly dispersed: Internet points of presence located in at least 50% first-level political subdivisions.</td>
<td>Broad: Domestic backbone 201 Mbps - 100 Gbps, international links 46 Mbps- 10 Gbps, more than one Internet exchange, bilateral or open.</td>
<td>Competitive: Many ISPs with low barriers to market entry. Some competition in international links or domestic infrastructure.</td>
</tr>
<tr>
<td>4</td>
<td>Common: Ratio of Internet users per capita at least 1 in 10.</td>
<td>Nationwide: Internet points of presence located in all first-level political subdivisions and rural access widely available.</td>
<td>Extensive: Domestic backbone &gt; 100 Gbps, international links &gt; 10 Gbps, Many Internet exchange both bilateral and open.</td>
<td>Robust: Many ISPs with both international links and domestic infrastructure open to competition.</td>
</tr>
</tbody>
</table>

Note: The column for Internet connectivity combines several measures used by Wolcott and Goodman. Despite the overall rating shown here, international links did operate in the range 129 Kbps- 45 Mbps.

controlled infrastructure. If it is assumed that education should follow rather than lead technological development in other sectors, then the current state of Internet use argues against extensive use in education, at least below tertiary level.

There are also linguistic constraints where it is proposed to use computers in a language other than English. Inevitably software is more limited in Urdu and likely to be extremely limited in the other languages spoken as mother tongue by many within the country.

**Analysis**

Pakistan seems to have followed an admirably cautious policy in its embrace of the technologies in education with their use in schools limited to the upper level of the relatively small secondary system. There is a potential contradiction in its policy on training which follows from its faith in the private sector. National policy is both to promote the use of the technologies to the extent, for example, of funding 75 per cent of the costs of training, while letting the private sector remain the main driver. The contradiction would be uncomfortable to resolve if, say, the private sector decided to concentrate international investment and development in India and South Africa and withdraw it from Pakistan.

There is one potential educational growth point: alongside many other countries Pakistan has recognised that there could be an increased role for the use of computer-based systems in the decentralised management of education, although this is not highlighted in its recent action plan.¹⁴ As its open university has experience of teaching educational management, it might well consider investigating this and developing appropriate systems and software.

**NOTES**

5. See note 4 above, p. 355.
8. See note 2 above, p. 15.
11. See note 10 above.
13. See note 3 above.
14. See note 1 above.