Introduction

The Background to this Book

Issues in Education and Technology is a response to the needs expressed by Commonwealth Ministers of Education at their thirteenth Triennial Conference (13CCEM) held in Botswana in July 1997. Ministers and delegation leaders were anxious that their education systems and their societies should not be left behind in the rapid advance of information and communication technology (ICT), which has profound implications for all societies in an era of globalisation. They were aware, however, that there are difficult choices to be made and complex issues to be clarified, as governments strive to take sensible decisions about investments in technology for education. There was some concern that previous investments in technology such as educational television and radio, or language laboratories, had not yielded the expected benefits for education. It was not clear whether countries should simply write off such past investments or continue to invest in trying to make them more useful. Some countries felt they would have to discard such technologies as outmoded and expensive in the face of high maintenance costs and current developments of cheaper and more sophisticated technologies in the field of ICT. There was also concern that the poor state of telecommunications infrastructure in many countries would necessitate massive investments in order to introduce the new technologies, which would largely benefit the already advantaged urban populations at the expense of deprived rural communities. This involves very sensitive issues of equity, which cannot be ignored in reaching decisions about investments in technology for education.

Some countries were concerned about the possible impact of these new technologies on the social and moral development of their citizens, in view of the risks of cultural invasion posed by such technologies. They felt it was inevitable that the norms, values and lifestyles prevailing in the countries of origin of these technologies would come to dominate their societies and erode their cultural integrity. This was not a welcome prospect, and for many countries it represented a new form of cultural imperialism.

Other countries had very practical concerns about the feasibility of investing in these new technologies, because they quite simply could not afford the capital, recurrent and/or opportunity costs involved. They realised that in addition to the costs of developing the necessary infrastructure, and acquiring and maintaining the new technologies, there would be the related costs of staff training and systemic changes that invariably characterise the introduction of new technologies. They faced difficult choices and competing priorities in the fields of education and development. In many countries

education systems are struggling to maintain quality; enrolment levels are still unsatisfactory; facilities and basic supplies are in a perilous state, and education budgets barely cover staff salaries. In such circumstances it is difficult to see how decision-makers could ignore these fundamental requirements and yet try to justify major investments in new technologies that could be regarded as beneficial to those already having an advantage. Indeed the message from the Education Ministers at 13CCEM, to Commonwealth Heads of Government, highlights the reminder that we still have a great deal of ground to make up in the area of basic literacy in most Commonwealth countries.

Despite these and other concerns expressed by Ministers and delegation leaders, there was also a strong awareness of the critical importance of investments in technology for education. It was felt that countries that do not make such investments risk being further marginalised in the new era of globalisation. Indeed several countries were able to cite the benefits they were beginning to derive from investments they had started to make in this area, and many had plans for such investments in the future. In several cases the role of the Commonwealth of Learning in helping countries with their distance learning projects was greatly appreciated. There was also an appreciation of the fact that with recent developments, some of the new technologies may hold the promise of feasible and more cost effective solutions to the problems of education for deprived groups and communities, as well as for education and development in general. All of this was clearly epitomised in a healthy degree of enthusiasm among Ministers and delegation leaders. There was a fairly positive instinct about the need to invest in technology for education. However, it was also clear that this enthusiasm coexisted rather uneasily with a large dose of concern and some element of scepticism. It was in view of this festering ambivalence that the Commonwealth Secretariat's Education Department decided to work on a book that would enrich the knowledge base from which key decisions can be taken about investments in technology for education.

Why this Book is Required at this Time

Changes in education are inevitable in the face of the inexorable advance of the knowledge and information age that is being fuelled by rapid developments in ICT. Decision-makers and education planners are therefore under pressure to make major changes that in most cases would amount to a quantum leap in investments in technology for education. There is a growing body of enthusiasts, and a rapidly expanding literature, extolling the virtues of such investments and warning of the consequences of failure to invest now. This multiplicity of advocates has in fact compounded the problem for decision-makers, who are now less certain about answers to investment questions regarding what kinds of technologies, in what quantities, at what levels and for what purposes. Part of the problem is that much of the literature tends to be couched in the language of vogue technology, with which most decision-makers and planners are uncomfortable. Some of this literature is little more than commercial hype, which ignores fundamental education issues that need careful consideration. There is therefore an increasing need for publications that provide a clear and dispassionate insight into key issues and problems which relate to making these inevitable changes in education through major investments in technology. This is one reason why the present book is timely.

At the other extreme, there is a small but assertive sceptic literature that cautions against an unquestioning embrace of the new technologies. Decision-makers cannot

afford to ignore the sceptics completely, because their messages raise key issues to do with equity, cultural integrity, and the negative aspects of technology in economic and social development. The ideology underpinning this kind of scepticism may appear to be idealistic or even naïve, but the issues involved need to be taken seriously in the difficult business of making decisions about investing in technology for education. It is therefore important that decision-makers and planners should have access to publications that highlight these critical issues without wrapping them in sceptical ideology.

Perhaps the most important reason for the publication of *Issues in Education and Technology* is the need to raise awareness of the fact that the changes involved in investing in technology for education, at the dawn of the twenty-first century, are of an unprecedented complexity and magnitude. This is not simply because of the difficult choices involved, or the sophistication of the latest technologies, or the high level of investments that may be required. It is due rather to the profound implications of such changes for the whole education process and their potential impact on the development of communities and nations everywhere in the new era of globalisation. It is therefore critical for decision-makers and planners to appreciate that in this case change is not simply a matter of an incremental use of various technologies in education. It is not even a matter of wholesale investment in certain new technologies such as computers. Rather it is about the role of technology in promoting deep systemic changes in education to meet the challenges of a new era. It is about using technology to enhance the way we deal with key issues of access and equity, management and efficiency, pedagogy and quality, as well as preparing citizens for an era of globalisation that will be dominated by technologies related to knowledge and information. In other words, we are confronted with the need for fundamental changes in education and development, rather than a need for changes in technology *per se*. *Issues in Education and Technology* therefore gives top priority to education and development issues, as a basis for exploring the ways in which technology in general can play a role in promoting and sustaining constructive and manageable change in education for development. It puts technology in context, as a tool that serves human purposes, rather than as an end in itself. It explores the place of a wide range of technologies in serving education, and does not confine itself to ICT. Through this kind of analysis, it helps to promote an understanding of the ways in which different technologies can interface with education and development in different societies to achieve various objectives.

In an era of technological surfeit it is easy to perceive developments in this field as a linear progression in which each new technology represents an improvement on the previous ones. The inevitable implication is that the latest is the best and those who do not keep up with the trends will lose out in the development process. Although some of this is true to some extent, issues of technology and development are in fact far more complex. Technological evolution is not a simple story of linear progression. It is more akin to a series of cyclic loops that are constantly in motion and moving mainly in a forward direction – sometimes rolling and more recently leaping forward. Most new technologies have definite advantages over the old ones that they seek to replace. However, new technologies may also bring new problems and result in the loss of some advantages associated with the older technologies.

Technology is always a means to an end, never an end in itself, so its impact on human society is far more important than its intrinsic characteristics. We must be wary of falling into the trap of technological determinism. There is nothing *inherently*

valuable about technology. It acquires value to the extent that it proves useful for and beneficial to human purposes. Therefore it is important that in dealing with education and technology, our primary concern and starting point should be that of human purpose. What are the goals and objectives of education, and what are the ways in which various technologies can help us to achieve them? At the same time, however, we need to keep in mind that in every country the goals and objectives set for education are profoundly influenced by trends in society at large. In turn, these trends are now being influenced as never before by changes in technology. From this perspective what is critical for education is not necessarily the latest or the most sophisticated technology, but the most appropriate technology for the purpose at hand. Responsible decision-making also requires that the need for investment in technology should be balanced against other educational needs in order to determine what is affordable. New technologies invariably bring new demands that need to be kept in view and balanced against their possible benefits. This book explores these and many other related issues, in order to strengthen the knowledge base from which decisions are made about investments in technology for education and development.

The Purpose and Scope of this Book

The purpose of *Issues in Education and Technology* is to provide insight into and understanding of the key issues in education and development that are increasingly making it imperative for nations to review their policies and strategies concerning investment in technology for education and development. In this context it offers policy guidelines and practical strategies for those who have to make major decisions about investments in, and use of, technology for education systems and institutions.

In the interest of clarity, it is important to highlight what the book does not set out to achieve as well as what it does seek to achieve. This book does not set out to *prescribe* solutions, but rather to offer a basis for making choices between viable options. In presenting these options for consideration, it tries to highlight the consequences and implications of different choices. *Issues in Education and Technology* is not concerned with presenting a catalogue of new technologies and what they can do for education. It is not intended to be an 'expert guide' to the available technologies and their use in education, nor is it meant to be a guide to 'value for money' in selecting hardware, software, or staff training programmes. Rather, its concern is with exploring technology issues relating to education and development, in order to highlight the need for sound policies and pragmatic strategies relating to investment in technology for education.

This book is neither theoretical nor academic. It seeks to promote informed decision-making in a very pragmatic manner by dealing with concrete problems relating to education and the role of technology. It highlights key issues related to policy and strategy, and outlines various considerations and arguments that are most relevant to the challenges that face decision-makers in this area. These issues and arguments are grounded in the social and economic evolution of technologies related to education and development. They are also very pertinent to the problems and challenges in the field of education and development at the dawn of the twenty-first century.

Issues in Education and Technology also seeks to be of practical relevance by outlining examples of current practices, through carefully selected case studies. However, these case studies are not meant to serve as examples of best practice that

should necessarily be copied. Rather they provide wholesome examples of policy, strategy and practice in the use of technology for certain educational objectives in particular contexts. For instance, the case study from Singapore (page 91) deals with the use of technology for management of the education system. It provides us with a holistic picture of policy decisions, implementation strategies and practical outcomes, against a background of wider development trends in Singapore society.

The overall aim of *Issues in Education and Technology* is to contribute to a greater awareness and confidence-building for those who are not technology specialists, but who have the responsibility for making critical decisions on investments in technology for education and development. It puts human purpose firmly at the centre of such decision-making, and takes the major challenges facing education as the starting point for exploring the place of technology in education systems.

Orientation, Structure and Content

Issues in Education and Technology starts from first principles, exploring the key issues that link education, technology and development. This provides a macro-landscape that serves as a framework for understanding the place of different technologies in education systems and processes linked to development. Within this framework we outline the ways in which evolving technologies have been of use and value in the process of education, as well as in driving the development process generally. It then becomes possible to link human purpose and educational goals much more systematically with various kinds of technologies, and to have a clearer sense of what kinds of policies and strategies may be most relevant for different societies at different points in their development.

The book is structured in three broad sections that cover the main areas in which technology can have the greatest influence and most decisive impact on education. These critical areas are access and equity; management and efficiency, and pedagogy and quality. In each area the main issues relating to education and development are first outlined and explored in order to provide a shared understanding. There follows an analysis of the technologies involved in order to highlight their current and potential usefulness in education and development. The analysis is not only set in functional and organisational terms, but also takes account of historical, cultural and socio-economic contexts. After this analysis there is an outline of the main challenges that decision-makers must address in dealing with policies and strategies for investment in technology that would promote positive change in education for development. Finally, attention is given to the key issue of formulating policies and strategies in this area. Each section of the book ends with one or more illustrative case studies, specially commissioned from a Commonwealth country.

Issues in Education and Technology draws extensively on experiences of Commonwealth countries which, given their diversity and varied stages of development in the use of technologies for educational purposes, provide a particularly rich resource base. Case studies in the form of country papers were prepared by Ministries of Education and submitted to the Commonwealth Secretariat for 13CCEM. In addition, in 1998 the Secretariat commissioned several more focused studies to explore the state of development in certain critical areas. These papers form the case studies in this book.

Who is this Book Aimed at?

Issues in Education and Technology is intended for use by a wide range of policy makers, planners and practitioners in education and development. It should be of value to Ministers of Education and their senior advisers, whose primary concern is setting broad policies and making investment choices for education and development. It should also be of value to educational planners and senior administrators responsible for designing and managing education systems. Heads of institutions and classroom practitioners should also find it useful, especially in decentralised education systems where they may have to make key decisions relating to the use of technology.

Beyond national education systems, *Issues in Education and Technology* should assist other ministries concerned with national development policies, since the issues involved have profound implications for development generally. Besides, investment decisions of this kind are not purely a matter for education ministries. National policies on science and technology, as well as development strategies, will have a bearing on investment decisions relating to the use of technology in education. It is hoped that this book will inform and influence key officials outside education, in a manner that will be of benefit to educational goals and objectives.

Issues in Education and Technology should also be useful to external development partner agencies seeking to assist countries in the area of investment in technology for education. At the very least it should help to promote greater sensitivity to the challenges which many developing countries face in making choices about this kind of investment. What some external partner agencies enthuse about as the self-evident benefits of technology in education may present developing countries with serious dilemmas relating to equity and opportunity costs. Similarly, despite the possibilities of moving towards adopting the latest technologies, the pace of change needs to be strategically managed in most developing countries' education systems. Most developing countries are also extremely sensitive about innovations that deepen their long-term dependency on external assistance.

Commercial purveyors of technology may also find this book useful. It might at least help to make them more conscious of, and sympathetic to, the difficulties that face decision-makers in dealing with policies and strategies relating to investments in technology for education. Manufacturers and service providers can play a major role in enlightening decision-makers about technological possibilities for tackling various educational problems. They can also help to deal with the peculiar requirements of some countries through design and development of customised equipment, software or systems. However, it is important that these manufacturers and service providers develop an empathetic understanding of the many difficulties and challenges facing decision-makers in education.

How to Use this Book

Decision-makers and planners concerned with investments in technology for education, as well as practitioners who work in the field of education and technology, can use this book in two major ways. First, they can use it to gain greater insight into the rationale for investing in technology for education. Discussions with policy-makers in various countries suggest that while investments are being made in some form of technology for education, the underlying rationale, policy objectives and strategic plan are not always

very clear. There is often a sense that pressure for change and the need to appear progressive have led to hasty decisions based more on the attractiveness of technology than on sound insight into educational needs and development goals. That is why *Issues in Education and Technology* seeks to provide appropriate insight by arguing from first principles rather than from a position of simple technological advocacy. It is important to help countries differentiate between the various education objectives and development goals for which investments might need to be made in technology for education. This book therefore takes education and development needs as its starting point, rather than being based primarily on what technology can do for us.

The second way of using *Issues in Education and Technology* is as a source of holistic examples of the manner in which technology is currently being used for specific purposes in particular Commonwealth countries. This is facilitated by the case studies which have been carefully selected to reflect the issues of access and equity; management and efficiency, quality and pedagogy. Each case study provides a detailed analysis of the issues involved; the underlying principles, and the difficulties experienced, as well as the policy decisions and practical strategies involved. The case studies therefore reflect holistic examples with positive and negative aspects highlighted for consideration.