Education and technology: A critical study of introduction of computers in Pakistani public schools

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Dedication

For
Yazoo

ABSTRACT

The importance of technology in education cannot be underestimated. There are compelling reasons for developing nations like Pakistan to introduce technology in their educational systems. Nevertheless the approach and methods used in introducing technology in schools are premised on an economic ideology and based on a techno-centric curriculum that leads to new forms of dependency by keeping individuals from controlling the decisions that significantly shape their lives.

Introduction of technology does not automatically guarantee enhanced learning or effective teaching. Technology in education should be used as a tool to increase communication, create awareness, break down existing hierarchies, develop new styles of creating knowledge, and make schooling and education more inclusive. Mere technical use of computers in education does nothing to empower students.

The techno-centric introduction of technology in Pakistani public schools is likely to produce inequality. A number of practices in Pakistan's educational and social structure will have to change for the potential of technology to be fully achieved. A shift is needed from 'learning about the computers' to 'using computers in learning', from 'acquisition of limited skills' to 'construction of knowledge', from 'teacher-dependency' to 'independent inquiry' and from 'teacher-centered' to 'student-centered' teaching methods.

However, such a change can only take place within a critical framework of education. The critical model based on integrated curriculum treats the computer not as an isolated subject but as a tool that helps learners enhance their critical thinking skills and seek various alternatives to solve problems.

Thus, it is important for educational policy-makers to realize that any effort at introducing technology in the educational realm requires theoretical discussion and a societal dialogue to arrive at a framework for technology's place in socio-educational contexts. Pakistan needs to develop and introduce educational technology to seek solutions for its unique economic, social, cultural and human and social development requirements based on its present level of development and evolution.

RESUMÉ

L'importance de la technologie en éducation ne peut etre sous-estimée. Il y à des raisons qui obligent des nations en voie de développement, comme le Pakistan, à faire introduire la technologie dans leurs systèmes scolaires. Les approches et les méthodes utilisées en introduisant la technologie dans les écoles sont bâtis sur un idéologie économique et fondés sur une programme d'enseignement technocentrique qui mène à de nouvelles formes de la dépendance en empêchant les personnes de contrôler les décisions qui façonnent d'une manière significative leurs vies.

L'introduction de la technologie n'assure pas automatiquement l'apprentissage rehaussé ou l'enseignement efficace. La technologie en éducation doit servir comme un outil pour augmenter la communication, créer la conscience, réduire les hiérarchies existantes, développer de nouveaux styles de produire des connaissances, et rendre la scolarisation et l'éducation plus inclusives. L'emploi purement technique d'ordinateurs ne sert en rien à donner le pouvoir aux élèves.

Il est très probable que l'introduction technocentrique de la technologie dans les écoles publiques du Pakistan aboutirait dans l'inégalité. Plusieurs pratiques dans la structure éducative et sociale du pays doivent se changer afin que le potentiel de la technologie soit réalisé. Il faut se déplacer d' 'apprendre les ordinateurs' à 'employer les ordinateurs dans l'apprentissage,' de 'l'acquisition de compétences limitées' à 'la construction du savoir,' de 'la dépendance sur l'enseignant' à 'l'enquête indépendante' et d'une méthode d'enseignement 'centré sur le professeur' à celle qui est 'centré sur l'étudiant.'

Pourtant, un tel changement ne peut se faire qu'à partir d'un cadre critique de l'éducation. La modèle critique de l'éducation, fondée sur un curriculum intégré, traite de l' ordinateur non comme un sujet isolé mais en tant qu'outil qui assiste aux étudiants à améliorer leurs facultés critiques et à chercher des moyens alternatifs à régler des problèmes.

Donc il est important pour les responsables d'éducation à réaliser que tout effort d'introduire la technologie dans le domaine de l'éducation exige des discussions théoriques ainsi que des dialogues sociétaux pour encadrer la place de la technologie dans les contextes socio-éducatifs. Le Pakistan aura à développer et introduire la technologie éducationnelle afin de chercher des solutions à ses uniques besoins économiques, sociaux, culturels et de développement humaine et social qui accordent avec son niveau actuel de développement et d'évolution.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

Today Pakistan finds itself in a strange position. On the one hand, it has been proclaimed the 7th nuclear nation in the world. In terms of intellectual capital this fact alone shows that a huge intellectual/scientific potential/capital that has been channeled into the strengthening of country's defenses or towards strengthening the corporate interests of the military. On the other, the educational milieu of the country is in a sorry state to say the least. It exhibits burgeoning dropout rates at the primary and secondary levels and even at the post-secondary level. The teaching force of the country is one of the lowest paid compared to other professional cadres of similar educational status. Finding themselves on the lowest rung of social status teachers' morale in Pakistan is very low. Those who manage to get into the system, suffer from what I call 'presenteeism', a state where they are physically present on the job but absent in mind, spirit and motivation.

At the infrastructure level the situation is deplorable. A very large number of schools (and teachers) exist only on paper. Even those who are physically present have educational facilities that are at best barely adequate. The country's educational system is a mix of public and private schooling in which only those who can afford private schooling (both high fees and additional private tuition and coaching) receive quality education. These students go on to become part of the elite (if they do not already belong to this class). Educational policy-making at the federal as well as provincial levels suffers from a lack of direction that is a direct result of absence of political leadership at these

levels in all education-related matters. Insufficient financial resources are allocated to the education sector. Yet even these meager resources are often under utilized due to lack of political and policy direction as well as inefficient administrative mechanisms.

Policy-making also lacks continuity, with each successive regime condemning the educational vision (if any) of the previous regime and embarking on increasingly grandiose schemes that are even more rhetorical and high sounding than previous ones. This policy 'ad hocism' is also due in part to the rapid change in governments (largely due to turmoil/instability in the political system), and long interludes where the military takes over political power. It is also due to the lack of continuity in the educational bureaucratic apparatus which, with each successive change in government, undergoes a change. Last but not least in this respect bureaucrats try not to stay in educational ministries for long, which results in lack of any long-term commitment to or ownership of an educational vision or a consistent policy.

This lack of continuity, vision, ownership and commitment, coupled with lack of resources for the human development sectors such as health and education, just to name two, often results in an over-reliance on foreign models and foreign financial aid for the educational sector. Of course, these models and aid come with strings attached to them. They also bring in their wake key buzz words and notions that, in the majority of cases, have little or no relevance to the socio-economic, socio-political and cultural ethos endemic to Pakistan's education system and its societal needs. These imported notions and buzz words are often adopted by the policy makers partly in an effort to secure the much needed financial aid for the educational sectors and partly out of a panicked concern to restore the country's ailing educational system.

These imported models and buzz words, when incorporated into existing policy measures (which are already in a state of mayhem), result in a pedagogical system and knowledge construction that most stakeholders in education find totally or partially irrelevant. The general apathy that results is translated into a disinterested student body that exhibits high dropout rates and general lack of interest in learning. It also produces a teaching body that is at the nadir of moral and social status, and parents who are increasingly unsure if the education they are paying for (often dearly) will afford their children any chance at upward social mobility.

Of late, the buzz words and notions that have infiltrated Pakistan's educational policy mindset at almost all levels are 'IT, technical knowledge, and educational technology'. The political leadership of the country (the quasi-democratic structure led by the military) is going to great lengths to claim that the messiah has finally arrived; that via the introduction of technology/computers the dark days of Pakistan's education system (and resultant economic backwardness) will soon be over. The education bureaucracy has jumped on the technological band-wagon without first reflecting on the intricacies and exigencies of such an introduction and has come up with several hastily put together projects to 'ensure' that the country's educational system is technologized so that the miracle cure may be administered as soon as possible.

The most pressing problems faced by Pakistani society today are related to poverty, exclusion from political participation, poor health care, unemployment and other issues of human development. Any implication that merely acquiring technical skills will solve issues creates an illusion that conceals the real issues. This is not to say that technology does not possess the power to challenge existing hierarchies and the status quo. In more

than one way, technology has the potential to address a majority of educational issues that developing countries like Pakistan face. However, the manner in which computers are being introduced into Pakistan's public education system seems more like an 'add-on' to an already dysfunctional set-up.

I argue that the way technology is being introduced into Pakistan's educational system is not geared towards creating a locally relevant knowledge system. Instead, it conforms to a market model in which the motivation is to create a market for foreign technology (hardware and software) and technological ideas. I also argue that, generally speaking, the introduction of technology based on an uncritical educational model suits the needs of the undemocratic governments and hierarchical societies in the developing world and the neo-liberal economic forces abroad. It suits the former because, unlike critical education, the market model of education does not prepare students to question unjust and inequitable social and political practices around them. It rather suits the latter because education based on a market model produces a global pool of semi-trained laborers that can process technological and scientific raw material without gaining the expertise required to produce knowledge that is socially relevant and beneficial to them. Thus, seen from a critical perspective, technology becomes a source of hegemony and yet another tool of oppression. However, if introduced wisely, where the first aim is to educate people, to help them to understand their circumstances, same technology can become a tool for liberation and a just society. In light of the foregoing discussion, the overarching question that guides my research is: Does the introduction of computers into classrooms affect issues related to educational development, equity and social justice in a developing country like Pakistan?

Research Objectives

I undertook my doctoral research with the following broad objectives:

- To examine the articulation and the implementation of the policy that guides the introduction of technology into Pakistan's public schools.
- To explore the impact of the introduction of technology on issues related to teaching, learning and educational development in Pakistan.

In order to achieve these research objectives I raise the following questions:

Research Questions

- How are the Pakistani state and policy-makers articulating the introduction of educational technology? What ideological global and local perspectives are at play in the introduction of educational technology in Pakistan?
- How is the policy on the introduction of educational technology being implemented and how do various stakeholders perceive the introduction of technology in education?
- How does this policy affect issues related to teacher training, teaching methods, learning, curriculum integration, evaluation?
- Does the introduction and use of technology in education necessarily result in raising educational standards and lead to the empowerment of people?

Significance of the study

My research on the introduction of computers into Pakistan's public education system makes significant and distinct contributions to knowledge in the field on a number of levels. On the theoretical level I combine theoretical and conceptual insights from critical

theory, critical pedagogy and critical theory of technology to demonstrate that relevance to local, societal, economic and educational contexts and needs provides both the best focal as well as entry point in research on the introduction/integration of computers in the educational realm. This is a significant contribution in that it combines sociological and educational perspectives that hitherto have been the polar extremes from which scholarly research has been conducted on the issue (Beynon and Mackay, 1993).

Secondly, my research links the introduction of computers into classrooms to the broader philosophical aims of education by asking the question: What kind of a society and citizenry does a technology-aided education aim to produce, especially in developing countries? This link has been hitherto obscure in the literature on the introduction of computers into classrooms.

In relation to this, my research also broadens the sociological context of the issue by bringing to the forefront questions regarding the link between computers in education and issues of equity and social justice. In this respect my research demonstrates that, unless the introduction of computers into classroom is aimed at fostering equity and social justice, it will continue to further the aims of a hierarchical educational system already in place.

A second area where my research contributes to knowledge in the field is that of education in Pakistan in general and the relationship between education and technology in particular. In the context of the former, my research attempts to fill in the void in literature on education in Pakistan both quantitatively and qualitatively. As one scholar notes, not only is the quantity of literature on education in Pakistan miniscule, most of the studies have been conducted from one or another narrow epistemic position 'which

serves to show the limited perspective of the debate on educational issues in Pakistan' (Naseem, 2004). The situation with respect to the latter, i.e., computers in education, is even more disappointing. There is hardly any study of consequence that seeks to explore the link between education and technology. As noted earlier, my research fills this void by presenting an in-depth study of both education in Pakistan as well as computers in Pakistan's educational system. My hope is that my research will provide an impetus and prove to be a stepping stone to more research in these important areas.

A third area where my research makes a significant contribution is that of scholarship on the introduction of computers into the educational systems of developing countries. In this respect my research provides a point of departure from conventional structural, cause-and-effect based quantitative research strategies and adds to a very small body of much needed qualitative critical educational research. Traditional research on education in most developing countries, including Pakistan, tends to both analyze and define education as an isolated activity in economic terms. Technology is mostly introduced as an add-on to the existing structure. My research shows that such reasoning and a techno-centric conception of knowledge fails to engage people; it adds, moreover, a critical holistic perspective on the socio-cultural issues relating to the use of technology in education, while at the same time demonstrating that the relationship between education, trainings, skills development, economic competitiveness and government action and rhetoric surrounding computers in classroom is very complex and even controversial. Furthermore, it brings home the point that the techno-centric model of introducing educational technology in the developing world will not lead to any educational benefit but will only lead to a grater dependence on the developed world.

While not denying the fact that an educated populace contributes to productivity and economic competitiveness, my research points out that the use of technology to promote critical education can provide benefits to society that are greater than the sum of the mere economic benefits. Secondly, by connecting education and knowledge-creation as the basic ingredients necessary for equitable and just human and social development, my research highlights the need for a greater and a more varied use of technology in education than is currently being offered in the developing world in general and in Pakistan in particular. Thirdly, it raises the need for debate and dialogue at various levels about the role of government in addressing basic human development needs through the use of technology in education, especially when many governments in the developing world justify the introduction of technology as beneficial to all segments of society.

A fourth area where my research contributes to the knowledge in the field is that of policy guidelines. Its recommendations can be useful to policy makers in Pakistan and also to their counterparts in intergovernmental organizations, donor agencies and non-governmental organizations. In this respect my research provides insights for educational policy-makers, administrators, planners, and curriculum development specialists concerned with how technology can be used to extend access to and raise the quality of education in the particular context of developing countries. Moreover, it is also intended for international organizations, development assistance agencies and NGOs that are often involved in advocating and promoting the use of technology as a solution to education problems in developing countries. It informs donor agencies by presenting Pakistan as a case study of the complex indigenous socio-cultural, political, historical and economic

dynamics that impose barriers to educational innovations that might successfully be implemented in the developed world.

Limitations

The qualitative approach that I use to examine the impact and significance of technology on current education practices in Pakistan has its limitations. With great regional, urban-rural, class and gender disparities in Pakistan's case it is hard to quantify all the impacts of technology on issues relating to the national educational systems. Due to the spatial, temporal and financial constraints that most doctoral researchers face I only focused on the introduction of computers in the province of the Punjab and the federal policies related to this province. Thus, my thesis should be read as the basis of an educational or theoretical framework rather than as a measurement tool.

Other limitations are in terms of the related topics that could have been discussed given their close links with the use of technology in education. Restrictions of space and the lengthy and technical nature of many related issues have prevented me from discussing certain detailed aspects of the introduction of technology into public schools of Pakistan. For example, open-source software (OSS)[1] and thin-client solutions[2] have been promoted by many who would like to see more equity in educational systems across the world. However, I did not focus on these due to limitations of time and space.

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[1] Open-source software (OSS) mostly comes with software developers' permission of an open-source software license, so that anybody may also develop the same software or understand how it works. Open-source software generally allows any person to make a new version of the software, port it to new operating systems and processor architectures, share it with others or market it. The aim of OSS is to let the product be more understandable, modifiable, reliable or simply accessible.

[2] Thin Client systems shift the load of processing, storage, management and security to the server thus reducing the need for mechanical components like drives or fans. Users interact with the system in the normal way through keyboard and mouse, but the central server handles all processing and files manipulation.

Similarly I have not discussed specific educational software that has proven to be helpful in some developing countries. Another important issue closely related with the use of educational technology is that of language. However, any effort to address such an important issue would require a thesis in itself. As stated earlier, due to these limitations this thesis should be read as a framework or a guide rather than a measuring tool, which highlights some qualitative issues relevant to the introduction of educational technology in the context of developing countries like Pakistan.

This thesis has been challenging for me to write on a number of accounts. I had expected that, given the propaganda and importance being put on technology, I would be able to find considerable literature and empirical research on the topic of educational technology in Pakistan, but unfortunately this did not turn out to be the case.

A Note on Conventions

Instead of ICTs, the most commonly used and widely accepted term to refer to the use of technology in education, I have used the broader term 'technology'. Although ICTs might be a better suited term, since it clearly indicates 'the use of technology for information and communication purposes,' which is central to educational achievement, I found that using such a term in the context of Pakistan was confusing for many of my research participants. The word 'technology', when elaborated to show what I mean by educational technology, works well with people who still have very little contact with ICTs in their lives. While using the term ICTs would have meant conforming to conventional usage, such usage does not widely reflect the mindset of an average Pakistani about ICTs. Therefore, I use the term technology in my dissertation.

Similarly, the term educational technology can be defined in a number of ways. For example, Wikipedia on-line encyclopedia defines educational technology as, " ...the systematic and creative blending of 'idea' and 'product' technologies with subject-matter content in order to engender and improve teaching and learning processes" (on-line). Although educational technology include all information and communication technologies (ICTs) for example, telecommunications technologies, such as telephony, cable, satellite and radio, as well as digital technologies, such as computers, smart boards, tele-conferencing, distance learning, information networks and software etc. With regards to the context of my research (public schools grade 6-12 in Pakistan) I use the term educational technology to denote meaningful use of connected[3] computers along with basic hardware[4] and software[5] that is currently being used in Pakistani public schools for educational purpose.

I have also used the first person singular in the text of my thesis, thus reflecting my conviction that as a researcher I formed an integral part of the research process and the fact that the data I report is in effect my interpretation and experience of the interpretations and experiences of my research participants.

I define policy factors as those efforts being promoted by the Pakistani government for example, provision of computers to school labs, encouragement of competition among Internet service providers for cheaper rates, involvement of private parties in the

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[3] Connectivity means the ability to access the Internet and utilize online resources.

[4] Hardware relate to the physical parts of a computer system, including the monitor, central processing unit, memory, storage disks, printers and scanners, and network equipment, such as routers and servers.

[5] The term software is used for 'instructions' that a computer needs to perform specific tasks. Examples may include word processors, e-mail clients, web browsers, video games, spreadsheets, accounting tools and specific educational software created for example to enhance, spelling, grammar, mathematical abilities of learners.

delivery of public education, etc. An analysis of policy factors provides the starting point for my research into how technology is being introduced in public schools, and the objectives and aims behind huge spending in the name of introducing technology.

Organization of the study

I have organized the dissertation into seven chapters. Following this first an introductory chapter I review in the second chapter relevant theoretical literature on technology and educational technology. In order to contextualize the debate on educational technology I begin by discussing and providing an overview of the three major theoretical orientations that frame the literature on the relationship between technology and society. I then deal with the definitional aspects of educational technology. In the third section of the chapter I discuss recent global changes that have played an important part in the debate on the use of technology for education. In the fourth section I specifically examine the literature on the relationship between technology and education along the contours of the debate between two leading perspectives, namely, techno-advocates and the critical thinkers of educational technology. Finally, I discuss how a critical theory of educational technology helps me situate the concept of educational computing in a socio-cultural framework and helps me draw the conceptual framework of my research. In chapter three I lay out the conceptual or theoretical framework of my research. I begin by explaining my epistemological stance. In the second part of the same chapter I deal with critical theory, critical pedagogy and critical theory of educational technology in terms of their origins, assertions, and evolution. I also highlight important tenets of critical pedagogy and critical theory of educational technology that are imperative for my research. Finally, I map out how a critical

theoretical framework, inspired by critical pedagogy and critical theory of educational technology, informs my inquiry.

In chapter four I explain my use of a qualitative methodology for inquiry into the introduction of computers in the public schools of Pakistan. I begin by discussing my research and the reasons for the use of a qualitative methodology. In the second part of the chapter I explain my reasons for the use of critical methodology and how critical theoretical framework (critical pedagogy and critical theory of educational technology) informs my methodology and choice of methods. In the third and the last part of the chapter I discuss some methodological issues and tools that I used during my research for data generation and data analysis.

In Chapter I five provide the reader with a socio-political and historical overview of educational policy-making in Pakistan. I especially highlight the importance of the socio-political, cultural and historical dynamics unique to Pakistani society that play out in educational policy-making and contribute towards rendering ineffective public educational institutions. I divide the chapter in six sections. In the first section I offer a brief description of the current state of educational state of affairs in Pakistan. In the second section I begin by tracing the educational policy-making and planning practices right after the birth of Pakistan in 1947. This section covers the initial 24 years of socio-political dynamics in relation to educational policy-making in Pakistan. The third section of the chapter covers the period between 1971 and 1978. This is the period when the country was trying to recover from its dismemberment (after the secession of East Pakistan) and when it enjoyed a civilian and democratic interlude between two periods of martial law. The fourth section highlights the socio-political conditions and educational

policy-making in Pakistan during the Zia period, i.e., 1977 and 1988. The fifth section covers the 'post –Zia' period of 1988-1999, while in the sixth and the final section I deal with current period of educational policy making and planning. I also examine the latest trend in Pakistan educational policy that emphasizes the use of technology in education as the panacea for all educational and economic (as well as social and developmental) problems in the country.

In chapter six I present the data that I generated for my research. I examine two projects initiated to introduce computers in public schools in Pakistan. The first project, entitled 'Establishment of Computer Labs in Secondary Schools in Punjab' (ECLSSP), was a federal initiative to introduce computers in the province of Punjab. I also examine a second project known as 'Up-Gradation of Schools through Community Participation Project' (CPP) launched by the Education Department of the provincial Government of the Punjab. I begin by providing descriptions of both these projects before discussing particular problems faced by each in turn. However, my data (both primary and secondary sources) reveals a number of common problems and issues arising out of both the projects. Finally, chapter seven presents my conclusion to the thesis I offer some recommendations for an effective introduction of technology in Pakistan's educational system.

CHAPTER 2

LITERATURE REVIEW

Introduction*

In this chapter I review the major relevant theoretical literature on technology especially as it relates to education. I have organized the chapter into four main sections. In the first section I discuss three major theoretical orientations that frame the literature on the relationship between technology and society. These theoretical orientations include essentialist/deterministic theories of technology (i.e., substantivist and the instrumentalist positions on technology), the social constructivist theory of technology and the critical theory of technology. I feel it is important to have an overview of these perspectives in order to contextualize the debate on educational technology theoretically and conceptually. In the second section I deal with the definitional aspects of educational technology.

In the third section I will discuss recent global changes that historically contextualize the debate on the use of technology for education. In the fourth section I examine the literature on the relationship between technology and education. I have organized this last section along the contours of the debate between two leading perspectives, namely, techno-advocates and the critical thinkers of educational technology. This does not mean that these are the only perspectives in this important debate, but only that they represent

* Please note, the terms such as developed societies/ West or less developed societies/ South refer solely to the levels of technology and are not intended to label developing nations as inferior to industrialized societies in moral, cultural, social or any other sense.

the major trends. Finally, I will discuss where my research is located in this debate and how theoretical and conceptual insights from this debate inform my research.

Different designations have been used to define and understand the current period in human history. These range from post-industrialist (Touraine, 1969, Bell, 1976) to the knowledge society (Lyon, 1988, Katz, 1988), the information/al as well as network society (Castells, 1996), neo-liberal period (Callinicos et al., 1994, Gordon, 1988; Hirst, 1997; Hoogvelt, 1997; Van der Pijl, 1999), global society (Held, 1999 and Held and McGraw, 2000), and what is commonly referred to as the era of globalization (Mann, 1986; Giddens, 1990; Castells, 1996; Dicken, 1992). Though grounded in different philosophical and theoretical sets of assumptions, what is common to almost all of them is the recognition that changes in the logic, nature and structure of technology in their various forms and manifestations is the factor that demarcates this era from the previous ones. Technology, especially in relation to information and knowledge, has become one of the most important and transformational aspects of contemporary life.

Technology serves as a means of carrying out daily life activities in modern societies. Recent trends in theorizing about technology (especially in critical theory, but also in feminist, post-modern and environmental theories) are about making the vital connections between the social and the technical. As long as these are seen as disconnected domains, any fruitful understanding of our existence is not possible. However, for a long time the humanities and social sciences rejected the discourse on technology as unworthy (Feenberg, 1999, p.2). Historically, common sense instrumentalism looked at technology in a neutral manner, requiring no particular explanation; thus, it was pushed aside as an aspect of private life and taken to be

irrelevant to the questions that concerned the thinkers of the great tradition in political theory such as Hobbes, Rousseau and Locke (Winner, 1995).

The developments in the biological and social sciences in the late 18th and 19th centuries, firmly rooted in the idea of progress promised by technology, forced the latter into the theoretical discourse of modernity. By the end of the 19th century, the writings of Marx and Darwin had begun to influence ideas about technology, so that by this time technical progress was believed to have set humanity on the path towards freedom and happiness. At the same time, in opposition to this 'technology as progress' trend, we do find a grand tradition of romantic protest against mechanization–the 'substantive theorists' who argued that technology was not neutral but that it embodied specific values. The technological tools we choose to employ determine our way of life.

It is from this point that I will start mapping the debate on technology. It is a brief account, since my primary area of interest is educational technology; nevertheless, no explanation of educational technology can be fully comprehended without looking at the central concern of the debate about technology, i.e., how far technology conditions social change.

Theoretical Perspectives on Technology

The Essentialists/Determinists

Technological determinism provides a technology-led theory of social change where technology is seen as a main force in moving society forward. Technical developments are seen as the prime causes of changes (good or bad) in society, and technology itself viewed as the fundamental condition underlying the pattern of social organization. Human factors and social arrangements therefore become secondary to

technology. Technological determinism is visible in the works of futuristic commentators, for example Large's *The Microelectronic Revolution* (1980) and Christopher Evans' *World Society at all Levels* (1979), where Evans declares that the computer will transform the world.

The essentialists/determinists trace their pedigree to a vast array of scholars, philosophers and literary icons such as Thomas Carlyle, Charles Dickens, Ralph Waldo Emerson, Nathaniel Hawthorne, Henry Thoreau, Mark Twain, Henry Adams, John Ruskin, William Morris, George Orwell and Kurt Vonnegut (Winner, 1977, p. 19). Even Karl Marx is included on the basis of his base-superstructure model[6]. The essentialist/determinist view is based on the assumption that there is only one 'essence' of technology and that it is responsible for the major problems or solutions of the modern world. Essence can broadly be defined as intrinsic and natural attributes only on the basis of which a thing can be understood. Furthermore, technology and its advancement are viewed as automatic and unilinear.

This school of thought however, is not homogeneous. It can be broadly divided into two groups: instrumentalists and substantivists. What differentiates these groups is the optimistic and cheerful faith of the instrumentalists in the doctrine of progress (through technology) and the gloomy and pessimistic assumption by the substantivists that technology is inherently biased towards domination. In the following space I will sketch the basic theoretical assumptions on which each of these groups bases its arguments.

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[6] Isolated quotations like, "The windmill gives you society with the feudal lord: the steam-mill, society with the industrial capitalist" (The Poverty of Philosophy, 1847), are used to label Marx as a technological determinist.

Instrumental theory of technology

The instrumental approach to technology is sometimes also referred to as the 'anthropological approach to technology' on the grounds that technology represents a given possibility of which we can take advantage in order to make ourselves better or worse. This argument draws upon the age-old view of human beings as toolmakers and tool users[7]. Technology in this sense is seen as value-neutral, a tool or a gadget, hospitable and amiable to the liberal democratic tradition. It is seen as neutral and subservient to values established in other social spheres, e.g., politics or culture, with no values of its own. Thus, in the instrumentalist view, technology has a precise place in public policy (Shriver, 1972) i.e., as an instrument of politics. Most of the government policies around the world are based on the instrumental view of technology. It is also the most common view of technology in the debate on the role of technology in education.

Substantive theory of technology

The substantive view of technology is also referred to as the 'sociological approach' or 'technological value determinism'. Adherents of this approach view technology as a force in its own right; a force that shapes societal values and has no rivals (Winner, 1977). In extreme cases technology is seen as an evil, destructive force (Leiss, 1970). Substantive theory is best known through the writings of Jacques Ellul and Martin Heidegger. The main argument of substantivists is that technology leads to the making up of a new brand of cultural system that reorganizes the social world, as an object of

[7] A slight variation of the instrumentalist view is called the 'epistemological approach to technology' (Mitcham and Mackey, 1971). The focus here shifts from the tool making and tool using history of man to the view that technology symbolizes a way of life.

control from which there is no escape. They argue that technology is a product of the culture, a force in itself that overrides all traditional or competing values; in the end it destroys humanity and nature.

For substantivists, the consequences of what technology does are more important than the apparent, superficial benefits. Ellul, for example, argues that "technique[8] has become autonomous" and the "technical phenomenon" has become the defining characteristic of all modern societies regardless of their political ideology (1964, p 14). Heidegger also supports this view. He argues that in our obsession with the transformation of the world, technology has completely overtaken us and that human beings have now become raw materials to be used in technical processes (1977, p. 17).

It is clear that, from the essentialist/deterministic standpoint, technology is independent of society. While the instrumental view of technology sees technology as neutral and as an instrument of public policy and therefore not an issue of political debate, substantive theorists see technology as a form of domination. Nevertheless, they are alike in that they are essentialist in contrast to the social constructivist theory of technology, which sees technology as something shaped by societies and societal values. In the following section, I describe briefly the main contours of the social constructivist view of technology.

Social constructivist theory of technology

By the 1960s and 1970s, technology had gained considerable significance in social theorizing. The challenges that had been discarded earlier as 'romantic

[8] 'Technique', can broadly be defined as the way or as the method of doing things that determines who we are, in other words developments in technology transform what it means to be human.

irrationalism' in the face of the dominant positivist paradigm (and determinism) were beginning to be taken seriously. According to Feenberg, by the 1980s

> it had become intellectually respectable to study the history and sociology of science and technology...early heroic expressions of a critical politics of technology were left behind and technology was approached as a normal social phenomenon ...technology [was viewed] as a dimension of society rather than an external force acting on it from an epistemological or metaphysical beyond (1999, p. 10. Parentheses mine).

This change in the ways of viewing technology led to the rise of the constructivist theory of technology. Central to this perspective is the use of methodological relativism, i.e., the view that the history of technology cannot be explicated on the basis of progression of more effective machines. In other words, technical reasons alone based and measured on the concept of efficiency cannot fully account for particular events of technical success or failure. Thus, any technical change is relative to other factors (such as interpretive flexibility or relevant social groups).

Constructivists like Pinch and Bijker (1987) argue that at a given time in a society there are always many workable technical alternatives that could have been developed in place of the successful one. It is not so much the efficiency but the variety of local circumstances that makes a difference in the selection of a particular technology. They argue that technology will succeed where it finds support from the social environment (Pinch and Bijker, 1987).

Proponents of the constructivist perspective argue that technologies are not good or bad, or even democratic or authoritarian *per se* (see Bijker and Aibar, 1992). This

however should not be mistaken for the value-neutral stance maintained by the instrumentalists. While instrumentalists see technology as essentially independent of any social factors, constructivists argue that some sort and level of technology is implanted in a society from its very first stages of development. As a result, values and other social constraints do play an important role in the shaping and use of technology. The relationship between values and technology is not so much a necessary link but something constructed and conditional that can change through the involvement of other social or technical actors. The constructivist view of technology thus pays closer attention to social alliances (such as those formed by businessmen, technicians, customers, politicians, bureaucrats, etc.) lying behind technological choices. The configuration of such alliances corresponds not only to technical logic but also to the logic of its selection. For constructivists, the worldviews of all the actors are expressed in the technologies they participate in designing.

For constructivists, multiple rationalities are instrumental in issues surrounding technology. For instance, it is not only engineers or scientists who participate in the construction of technology; traditional distinctions between technical and social elements (that are not fixed but fluid in character) also play a major role. In the process of constructing technologies, technical factors can be transformed into political issues or *vice versa*. Therefore, constructivists hesitate to accord a privileged position to any one key actor or process in an explanation of technology. Anthropologist, Brian Street (1984) argues that technology cannot be neutral because it is not *a*social; it cannot be separated from specific social contexts. He states:

> Technology is... not a neutral "thing" that arises out of disinterested scientific inquiry... It is itself a social product that has arisen as a result of political and ideological processes and institutions and its particular form has to be explained in terms of such processes (Street, 1984, p. 65).

Constructivists reject the technological deterministic outlook that takes a very linear view of technology. For them, the social construction of technology is a continuous process spanning all the traditional stages of development, from design to diffusion. For example, Brian Wynne claims that the main ideological pillars of the social alienation of innovation in modern technology are the myths of technological determinism and of expert objectivity (1983, p. 27). The constructivist theory of technology thus rules out any role for an objective expert.

While the constructivist theory of technology has forcefully made a case for the relationship between the technical and the social, it has been criticized by critical theorists of technology for the lack of explicit concern about political or evaluative issues. To this I now turn.

Critical theory of technology

> "Critical theory argues that technology is not a thing in the ordinary sense of the term, but an "ambivalent" process of development suspended between different possibilities. This "ambivalence" of technology is distinguished from neutrality by the role it attributes to social values in the design, and not merely the use, of technical systems. On this view, technology is not a destiny but a scene of struggle. It is a social battlefield, or perhaps a better metaphor would be a

parliament of things on which civilizational alternatives are debated and decided" (Feenberg, 1991, p.14).

Critical theorists of technology purport to analyze new forms of oppression associated with modern industrialism. They recognize that increasing choices about personal freedom, civic participation, education and a wide range of public activities involve technical decisions; thus, they emphasize the need to analyze carefully the design of technology as it is the very design that is loaded with political consequences for its users.

One of the distinctive concerns of critical theorists has been with the way technology has been selectively appropriated in the capitalist production process. Such concern and analysis derives from Weber's theory of rationalization (Lesiss, 1990; Aronowitz, 1988). Critical theory rejects the notion of the neutrality of technology. Noble's (1977) work makes explicit the role of technology as part of the social struggle. Postman (1993, 1995) has used a similar line of argument for the use of technology in education, questioning the supposed neutrality of technology and its implied automaticity for empowerment across the board.

Critical theorists of technology draw our attention to the fact that the real issue is not technology *per se* but the values it embodies. Theorists such as Feenberg (1991, 1999), Fleron (1977), and Dordrect and Kluwer, (1990) remind us that technology embodies the values of the elite. Therefore any analysis of technology requires us to move away from the dominant technological rationality and closer to critical rationality in order to reflect on the larger context of technology. Such an activity requires a critical articulation and review of the dominant values, which involves a cultural critique of technology. Feenberg (1991), for instance, argues that the relationship of human initiative to the technical

system needs examination "since modern hegemonies are increasingly organized around technology, this relationship has become central to the exercise of political power" (p.v).

The theoretical perspectives discussed above continue to influence the way technology is perceived, designed, produced and used in almost all institutions of society and sectors of the economy. They have also been influential in determining the ways in which technology has permeated the realm of education and also how it is used in order to advance educational objectives. I now discuss some recent developments in the debate on the use of educational technology.

As mentioned in the introductory chapter the scope of my research is limited to the sub-set of information and communication technologies, namely computers and related peripherals (printers and other hardware) as means of instruction, or the use of computers in the classroom. Before mapping the current debate regarding the use of technology I feel it is important to discuss briefly the changes in global conditions that are accredited to the development and use of ICTs. These changes in global conditions have led to a major paradigm shift in the way of thinking about education. A brief review of these changes can afford us an opportunity to see the pressures and conditions that have resulted in a situation where computers are being looked at as a major tool for instruction and a symbol of quality in education within the classroom.

The Global Context

Globalization has had major implications for the need to restructure education. A useful way of understanding the changes in global conditions that have led to a restructuring of education is to start by looking at the changes that information and communication technologies have brought to the realm of economics and the present-day

neo-liberal narrative of educational and pedagogical practices. These changes have been widespread and can be mapped along two axes: international (global) and domestic (local).

Let me first briefly discuss the global dimension. The new global economic system is based on making trade easier between nations by allowing the freer movement of goods and services. Innovations in the field of ICTs have made possible the removal of various controls that were deemed to be barriers to free trade. To take one example, the use of computers and the Internet has made capital flow and investment possible anywhere in the world. This has led to the creation of an altogether new type of global economic system with a fundamental change in the nature of employment (especially in the developed world). This change has resulted in the flight of manufacturing jobs to developing countries where the cost of labor is cheap and production costs are low due to several factors, among them the absence of strict safety, labor and environmental laws.

Thomson (2005) gives the example of the Australian provincial capital of Adelaide, which has now turned into a 'rustbelt' [9]city. Adelaide used to be a manufacturing success story in the 1950s, but with cheap labor and high government inducements, industrial competitors from Asia were able to attract many companies who started moving their operations offshore. This was made possible by advanced technologies and national policy-makers who wanted "Australia to be a part of a restructured global economy" (p. 83).

Domestically, in the developed world, industry consolidation and automation has eliminated a large number of positions in many sectors; this along with large-scale

[9] The term 'rustbelt' is a relic of the industrial era, the assembly-line manufacturing plants or areas now technologically obsolete. It is a binary opposite of "sunbelt" areas with high tech industries, for example, Palo Alto, also known as the Silicon Valley in California.

introduction of computers into the workplace has changed the very nature of the majority of jobs. As compared to manual jobs, computer-controlled processes require a totally different set of skills. The contemporary life-long learning paradigm requires continuous effort on the part of the learner so as to keep up with rapidly changing technology and software.

The flight of jobs from the developed to the developing world can be traced in two phases. In the first phase, certain manufacturing jobs that were once a means of upward mobility for the economically disadvantaged classes in the developed world were transferred by "fast capitalist enterprises (who) move from country to country seeking the cheapest labor and highest government inducements" (Thomson, 2005, p. 81). This forced people to fit into new "service identities" in order to find work which was low paid and insecure (Allen, Massey, and Cochrane, 2000).

In the second phase, even the so-called 'low paying' service jobs have been or are being transferred to developing countries where labor is still cheaper than it is in the developed countries and where populations show the minimum level of technical literacy needed to carry out such jobs. The knowledge economy now defines the economic prosperity of the developed world, where citizens are expected to produce knowledge or 'intellectual capital/intellectual property' that can be consumed by the rest of the world.

Such restructuring of the global economy has provided politicians, businessmen and champions of the free market with an opportunity to create/portray a crisis situation in the economy spawned by the failure of educational systems to deliver what it takes to save the economy. In this way neo-liberal ideology has been able to penetrate the domain of education in the name of making education more conducive to the new developments.

Neo-liberal reasoning has basically used three strategies to gain easy entrance into pedagogical practices. The first strategy consists in rhetoric that portrays economic globalization as unstoppable and technology as apolitical or neutral. The second strategy obscures the political nature of the neo-liberal discourse and hides the differences of interest and power. The third part of the strategy blurs the distinction between what formerly used to be distinct domains, for example, education, culture, media, information, knowledge, and economics. The neo-liberal ideology has influenced the introduction of policies that have led to a total restructuring of the educational sector.

The economy of developed societies is increasingly based on access to information services where most business, communication, and research now take place over the Internet. Thus, access to computers and networks has become as important as access to traditional telephone services, while ICTs are viewed as the modern engine of progress. The impact of this change is visible in the sphere of education, which is now seen as the means to realize the change from an industrial to an information age. In this context, schools are under pressure to provide access to the information highway as quickly as possible.

This sense of change is also evident in the discursive articulation of the educational realm. In a world that has increasingly developed an infocentric view, most of the familiar things and terms are being redefined according to this view. For example, books are portrayed as information containers, libraries as information warehouses, universities as information providers, learning as information absorption, teaching as information facilitation, markets as information-driven stimulus and response (Seely and Duguid, 2000).

John Seely and Paul Duguid (2000) have termed this desire to see things in the light of information as 'infoprefixation' or what Postman (1992) terms 'technopoly '. Postman defines technopoly as:

> A state of culture. It is also a state of mind. It consists in the deification of technology, which means that the culture seeks its authorization in technology, finds its satisfactions in technology, and takes its orders from technology. This requires the development of a new kind of social order, and the necessity leads to rapid dissolution of much that is associated with traditional beliefs (1992, p. 71).

Thus, the change, whether we call it technopoly or infoprefixation, has also affected how people think about education. Different theorists have argued that change in the way of thinking about education is a result of a complex mixture of a variety of reasons. They also come up with diametrically opposing points of view regarding the reason for this paradigm shift.

Changes in global conditions have different but important consequences for education in the developing countries. One of the most salient consequences has been the change in the nature of the pool of cheap labor in these societies. Earlier on this pool comprised semi-skilled labor to which manufacturing jobs could be outsourced. The changes in global economic conditions now require this pool of cheap labor (in the developing countries) to have basic computer literacy so that basic IT jobs (e.g. data entry, etc.) could be outsourced to them.

Some developing countries, like India, which took early initiatives in introducing technology into public education, have been granted many service-related out-sourcing contracts by the developed world. India especially is seen with both awe and envy by

Pakistani policy-makers who were not wise enough to follow the same path.[10] The factors mentioned above, along with the push by supranational organizations to demonstrate a certain level of connectivity in order to apply for various loans from international funding agencies such as the World Bank and the IMF, have created greater urgency to develop technology-related education.

Various structural adjustment programs that require sharp cuts in public spending and that inevitably lead towards privatization have resulted in added pressure on the education systems in developing societies to produce students equipped with basic IT skills. Thus, much of their scarce resources have been diverted to produce a class of global workers apt at performing basic IT tasks. In a hurry to provide technical literacy needed for most of the manufacturing and service industry jobs in the globalized world, many developing countries have jumped onto the band wagon of technology in education without carefully analyzing or planning how they should go about introducing such changes.

Many developing countries hope to leapfrog the existing technological gap by imitating other countries that have been successful without taking into account their own particular socio-economic conditions or infrastructure, which may or may not be able to support the kind of technology in which they are investing[11]. Hasty planning, lack of critical reflection about social and historical construction and contextualization of pedagogical practices along with the desire for overnight change may at best lead the

[10] India's emergence as an economic power next to China is usually attributed to its adopting technology and being able to produce technically literate citizens available on demand to be used by Silicon Valley. Such analyses always ignore other socio-cultural, political, geographical, linguistic factors in India's success.

[11] This is not to imply that the developed world took a well calculated and thought out plan of introducing technology in education, but the socio-economic conditions in the developed world stood in sharp contrast with the conditions in the developing world. It should also be noted that neither the developed nor the developing world is a homogeneous entity and that vast differences exist within each.

educational systems in these societies to produce students who can show certain levels of technical literacy or produce basic IT raw materials, but not their 'own' science or 'intellectual property'.

The global changes discussed above have ignited a debate about the relationship between technology and education. The concept of educational technology in this sense provides the intellectual and conceptual space where different positions in this debate are in contestation. While the debate on the use of technology in education is multi-dimensional, it can broadly be mapped along the philosophical and theoretical positions discussed above. On the one hand there are the critical thinkers, who take their bearings from the critical theorists of technology to argue that the use of technology in education should be guided by the social realities and educational and developmental needs of the society. On the other there are those who, following substantivist theories of technology, argue that technology itself is neutral and that it's effective use in education will necessarily be beneficial. In the following space I will briefly draw the contours of this debate.

Techno-advocates for Computers in the Classrooms or Technophiles

Postman (1992) defines this group of people as, "one-eyed prophets who see only what new technologies can do and are incapable of imagining what they will *undo"* (p. 5, emphasis original) . Techno-advocates comprise an influential group of scholars who ardently support and propagate the use of technology for educational purposes. Grounding their arguments in the theoretical assumptions of the substantivist theorists of technology, they argue for an immediate and spirited introduction and use of technology in the educational realm. For them, doing so will not only yield transforming effects; it

will also constitute recognition of the inevitable. Prominent among the proponents of this group are scholars such as McLuhan, (1962), Negroponte, (1995), Rheingold, (2003, 1994), Hiltz and Turoff, (1993), Papert, (1980), McKenzie, (1993 & 1991), and Norris, (1985), who view technology, especially computer-based environments, as progressive arenas for social exchange and learning. They view technology as neutral and thus capable of providing the basis for an educational renaissance that will create a generation of problem-solvers well prepared for the information age. They argue that computers can be used to enhance learning and provide insight in a more productive and engaging manner than traditional teaching within classrooms (Brown and Duguid, 2000; Burke, et al., 1988; McLuhan, 1962).

Much of the contemporary literature on the use of technology, especially computers and web based learning in education, takes its bearings from the conceptual base provided by the techno-advocates. Contemporary literature is grounded in the belief that that the new instructional technologies may offer tools for the information production and knowledge creation necessary to the demands of the globalized world (McKenzie, 1993; Henkoff, 1992; Papert, 1980, 1993; Dede, 1989; Hunter, 1993; Barron, & Orwig, 1993; Dyrli & Kinnaman, 1994; Hefzallah, 1990; Kurshan, 1991; Pearlman, 1991; Reif & Morse, 1992; Stinson, 1994; Toffler, 1981).

For instance, proponents of the use of computers within the classrooms argue that the role of students in the new era has shifted from the consumption of information to the production of information. As such, the old curriculum and methods of teaching that were devised for factory production and were based on compliance and memorization are no longer relevant in a society where the factory system has moved offshore (Henkoff,

1992)[12]. According to McKenzie (1993), the use of new technologies helps fulfill the needs of the current age that requires the students to be:

> Infotective–a student thinker capable of asking appropriate and powerful questions about data (with analysis) in order to convert the data into information (data organized so as to reveal patterns and relationships) and eventually into insight (information that may suggest action or strategy of some kind). An infotective solves information puzzles and riddles using all kinds of clues and new technologies...An infotective is a skilled thinker, researcher, and inventor (pp 4-5).

McKenzie's definition is in congruence with the profile of the workers needed in the new global economy. The National Alliance of Business for instance has called for workers with "the fourth 'R', (work force) readiness, which includes reasoning, analytical, creative, and problem-solving skills, and behaviors such as reliability, responsibility, and responsiveness to new work requirements" (NAB, 1987, p.1. Parenthesis added).

Furthermore, the techno-advocates argue that computerized classrooms support independent work as well as collaboration among students. On the one hand, the use of computers as 'teamwork tools' gives students a better orientation toward collaborative work. On the other, it also allows them to work at their own pace and tackle more complex tasks. Students can construct their own understanding through the use of information over the Internet, which helps them in self-direction and makes them more

[12] This argument raises an altogether new debate about the relevance of the use of computers in the developing world where the economy is still based on factory production systems of 1950s and1960s of the West. If this argument is to be accepted then there appears to be a contradiction in another argument given by the proponents of the use of technology i.e. computers serve as an umbrella under which disparate groups and nations can cooperate and that technology will liberate the world and give developing countries a fair chance to participate in the global economy.

independent. Use of different software allows grater creativity by letting the learner use multi-media in order to employ text, pictures, sounds, etc., simultaneously. Computers thus amplify the resources that teachers or libraries can offer to their students.

Outside the classroom, computer networking even allows students to communicate and collaborate with others around the globe. Communication tools like e-mail, list-serves, bulletin boards, and chat groups allow an immense flow of information. Use of computer assisted technology such as voice recognition systems, dynamic Braille displays, speech synthesizers, and talking books provide learning and communication alternatives for those who have developmental or physical disabilities. All of the above are touted wonders that can transform education. It is also argued that computer-mediated communication helps in relieving social isolation[13].

In sum, it is argued that use of technology for educational purposes imparts a very important set of vocational skills that serves students well in the working world. It increases their autonomy and confidence and provides them with the necessary intuition for knowledge creation and manipulation of information.

McKenzie (1993) argues that the electronic text, because of its permeability, fluidity, malleability, responsiveness, availability and transportability, has more impact than the printed text and supports the growth of open-minded thinking and collaboration in a culture. The printed word is seen as lockstep reasoning while students in the traditional education system are seen as consumers of others' ideas, borrowing their thoughts from the experts, not able to demonstrate any critical thinking.

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[13] However one important fact that is usually not mentioned along with these wonders is that all such sophisticated software is extremely expensive for a majority of schools to afford and keep pace with, despite the efforts of governments/parents/administration's/communities to support technology. Thus only extremely well off schools can hope to provide such software to all the deserving students.

It is interesting to note that this line of reasoning is very much in sync with the economic reasoning of the neo-liberal paradigm. Critical thinkers argue that capitalist jargon has permeated the educational discursive realm. The terminology used for education through electronic texts is identical to that used for referring to monetary units. The student as an infotective (McKenzie, 1993), like the monetary unit in the global economy, is permeable[14], fluid, transportable[15], malleable, responsive, and available[16].

The above-mentioned view is dominant in the discursive realm of the educational technology debate (McKenzie, 1993). Not only do the majority of educationists but so do the majority of policy-makers, practitioners, and decision makers also subscribe to this view about the use of technology in classrooms. The notion is however not without its critics. Some of the latter like Harper (1987) argue that computers are increasingly being used as a symbol for selling the neoliberal agenda of privatization to dissatisfied parents, making them believe that the use of computers in classrooms will give the parents more

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[14]ICTs have allowed permeability of Trans National Corporations (TNCs) across the globe that has in actuality led to greater centralization of power unlike the popular belief that technology leads to greater freedom for workers. Previously, messages took so long to travel that most decisions had to be made locally, this local decision making power was considerably reduced by the international telegraph and telephone lines but it almost diminished as Shoshona Zuboff (2002) mentions since the advent of ICTs "the paradise of shared knowledge and a more egalitarian working environment just isn't happening, knowledge isn't really shared because management doesn't want to share authority and power".

[15] Compare again the similarity between currency and electronic text. Like the electronic text, currency is fluid and very transportable. Millions of dollars can be moved from one place to another in the blink of a second. All this has been made possible due to the introduction of modern Information and Communication Technologies not limited to computers but embodied in the use of computing technology. The whole world saw the wonders of the modern technology in the crisis it created in some of the newly developed Asian countries. After the trade liberalization of 1993 private capital estimated at approximately $220 billion flowed into the five Asian economies - South Korea, Indonesia, Malaysia, Thailand, and the Philippines. However, reversal of flows took place in 1997 as a result of a sudden shift in confidence. In a short period roughly $100 billion were taken out of these national economies, which led to a total collapse of their economies.

[16] The malleability, responsiveness and availability of written text again echo the neoliberal fascination with the global economy where things can be modified, currencies can be devalued the fate of nations can be decided by various structural adjustment programs, treaties and regional pacts according to the desire of the powerful TNCs. In such a global economy nothing is permanent or given and the only thing permanent is change. Those who lag behind or have difficulty in keeping up with change are portrayed as incompetent and deserve to be left to their fate.

autonomy, choice and authority with respect to what their children should learn. Harper (1987), for instance, cites the following words by Papert as the epitome of such thinking:

> We are at a point in the history of education when radical change is possible, and the possibility for that change is directly tied to the impact of the computer...Increasingly, the computers of the near future will be the private property of individuals, and this will gradually return to individuals the power to determine patterns of education. Education will become more of a private act, and people with good ideas, different ideas, exciting ideas, will no longer be faced with dilemma where they either have to "sell" their ideas to a conservative bureaucracy or shelve them. They will be able to offer them in an open market place directly to consumers. There will be new opportunities for imagination and originality. There might be a renaissance of thinking about education (p.7)

Papert (the developer of the LEGO Mindstorms product line) is considered to be world's foremost expert on technology and learning, and is a staunch proponent of the use of computers in schools. His seminal work *Mindstorms: Children, Computers and Powerful Ideas* (1980) makes a case for how computers can assist people to learn for themselves. Similarly, in his later work, *The Children's Machine: Rethinking School in the Age of the Computer* (1993), Papert takes the position that technology can and will totally revolutionize the way that kids learn and schools operate.

Papert's view has inspired a large number of educationists, practitioners and policy makers to see a deep connection between this method and the constructionist theory; they believe that the use of computers can help students construct their own understanding. It is, for instance, argued that computer-based learning provides students with opportunities

to connect prior learning experiences with current experiences. Computers provide students with a variety of tools and resources to work with. One major argument put forth in this respect is that the mission of educational institutions is to produce a work force that can meet the demands of the market. The argument goes on to claim that technological literacy imparted by the use of computers provides students with the abilities needed to evaluate information critically and operate the hardware and software that are in demand in the market today.

Similarly, Dede (1989) argues that technology must be incorporated into educational systems if students are to be prepared for the competitive global marketplace. Teachers must adjust to the rapid technological development and be innovative in pedagogical methods. The American Association for the Advancement of Science (AAAS, 1990) also endorses this view. Hunter (1993) advocates computer-and-communications networking for the kind of reform that education needs in the present time. He believes that ICTs can give teachers and students more power in the classroom.

Others (Hefzallah, 1990) see the advances in scientific developments, telecommunications, information processing, and dissemination technologies as major assets to meet the educational needs of our increasingly technological society. Yet others, such as Barron and Orwig (1993), argue that including technology in education yields benefits like multi-sensory delivery, increased self-expression and active learning, cooperative learning, communication skills, multicultural education, and student motivation (p. 3).

Scholars like Dyrli & Kinnaman (1994a), Kurshan (1991), Madian (1990), Pearlman (1991) Reif & Morse (1992) and Stinson (1994) have argued that computers and

multimedia technologies can and will form a major part of the restructuring of the educational process. Such restructuring calls for redefining the role of teachers, the ways they teach, the ways students learn and the ways they are evaluated, along with a total reorganization of the structure of the school (Dyrli & Kinnaman, (1994b; Pearlman, 1991; Stinson, 1994). These and other techno-advocates are often disappointed by the fact that schools have not been able to change their basic organizational structures so far. They argue that the curriculum and teaching methodology of the past are unsuited for today's world. For them, any delay means a delay in the transformation of education from the old to the new and dynamic system. Toffler (1981) defines the present times as the "third wave era", i.e., the post-industrial information age in which change takes place continuously at all levels of society.

Critical theorists of educational technology

In this section I group together pedagogists who use a critical framework to examine the role of technology in education. I like to refer to them as critical thinkers of educational technology. However, they do not comprise a homogenous group. While they operate from a common set of epistemological assumptions, their foci, levels and units of analysis vary.

Critical theorists of technology argue that there can be "at least two different civilizations based on different paths of technical development" (Feenberg, 1991, 15). These two paths will be determined by the technical choices made between production by assembly lines and computers designed to intensify control, on the one hand, and by computers designed and used for expansion of communication on the other. Critical theorists of educational technology also argue that two very different kinds of educational

systems can result from different paths taken in the implementation of technology in educational institutions. They argue that mere drill and practice exercises do nothing to support knowledge creation or reduce power differentials and inequity in educational institutions. However, if technology is implemented to enhance communication and the understanding of different subjects and if learning actually takes place through technology, then a different, more egalitarian and just educational system can be created. Such a path requires utilizing educational technology to reduce the power differential between teachers and students and in the hierarchal structure of the educational system. It also requires that technology in education be used to promote dialogue and better communication between teachers, students and peer groups.

Among the critical thinkers of educational technology we find a range of voices, ranging from theorists like Bowers (2000), who is pessimistic about the role that computers can play in the classrooms and is thus against their use in classrooms, to scholars such as Larry Cuban (2001), who advises caution but does not totally condemn the role that computers can play within the educational system. Their concerns with respect to educational technology are very different. These concerns range from the cost of technology (Roger Shanks, 2000; Apple 1991, 1996,1998; Postman 1992, 1993, 1995) to environmental degradation (Bowers 2000, 1997, 1998), excessive individualism (Postman, 1993, 1995), technocratic mind frames (McLaren, 2003, 1993; Postman, 1993, 1995), lack of deliberation and research about the issue of introducing technology and the need for broader research to examine issues related with educational computing (Winner, 1986; Gall and Borg 2003; Grossen 1998; Selwyn 2000; and Ridgeway 2001), the complexity of the relationship between technology and literacy (Self, 1999), cultural and

age suitability (Healy, 1998; Franklin, 1990), the importance of sustainable funding and of evaluation and monitoring for educational implementation of technology (Tetreault, 1998; Katz, 1999; Clark and Estes, 1999), contextual and situated usage of technology meaning the need to identify the unique learning needs of a particular student population before going ahead with introducing technology in schools, (Clark and Estes, 1999; Tyack & Cuban 1995; Cuban, 1986, 2001), political design and the controlling power of technology (Franklin, 1990; Apple, 1991; Postman, 1993, 1995; Nobel,1997, 2002), the need for new approaches in curriculum, and technology-related changes in curricula or curriculum integration (Veen et al., 1995; Tweddle, 1993; Knight and Knight, 1995; Nicholson, 1995), and negative side effects (Kerr, 1996; Goodman, 1995; Bowers, 2000; Cuban 2001).

Despite raising different concerns, there are elements that are similar among the various scholars writing about the educational use of technology. Such epistemological similarity allows me to group many of them together under the rubric of critical thinkers of educational technology. All critical thinkers of educational technology situate computers and web-based technologies in the socio-political, economic and cultural contexts in which they are used. They direct our attention to particular moral, political, cultural, ideological and environmental concerns that should be addressed before the introduction of technology in education. They use a critical framework to trace the impact of technology on education and argue that, so far, economic interests have determined the design, introduction and utilization of technology in educational systems. Critical thinkers of educational technology argue that the aim and purpose of education is to empower people with the ability to transform unjust and undemocratic educational and

social practices. Therefore, the introduction of technology into education should be about using technology as an educational tool to raise critical awareness and enhance knowledge and not a 'technique or skill' that does little for knowledge creation and is directed towards creating a cheap labor pool.

In the following I will briefly chalk out some of the key positions held by critical theorists of technology regarding the introduction of technology in the educational realm.

Technology and ideology

Critical theorists of technology argue that there are ideological motivations on the part of governments and big business behind the current advocacy for introducing technology in education. According to this line of reasoning the widespread introduction and use of computers in the educational realm is a result of the politicians' desire to avoid any accountability regarding the economy and deteriorating conditions in the standard of living. They accuse the politicians of side tracking the main issues and pre-occupying the public with technology, touting it as a solution to all problems. Furthermore they see such wide spread use of computers as evidence of the desire of the business world to control education (especially through advertising by computer hardware and software manufacturers) thereby creating a situation where the pressure comes directly from parents to have computers in the classrooms. According to Apple (1991, p. 71):

> Computer companies ... gear much of their advertising to the educational possibilities of computers. [The home market is created by coupling] particular computer usages to schools where parents – especially middle class parents with the economic wherewithal and keen motivation [to ensure mobility] – purchase machines compatible with those in schools.

Critical theorists of educational technology argue that the rhetoric used in government statements and by the media simply spread myth that technology is culturally neutral and that its impact on education is limited solely to its use within the classroom by the teacher. To quote Apple (1991, p. 72) again:

> The new technology is not just an assemblage of machines and their accompanying software. It embodies a form of thinking that orients a person to approach the world in a particular way. Computers involve ways of thinking that under current educational conditions are primarily technical. The more the new technology transforms the classroom into its own image, the more a technical logic will replace critical political and ethical understanding. The discourse of the classroom will center on technique, and less on substance. Once again 'how to' will replace 'why'...

Neil Postman (1995 p. 41), points out that the hidden nature of such ideological motivations are embedded in every technology. These ideological ideas – which give each technology a unique view of the world – have been hidden from our view because of their somewhat abstract nature. However, these ideas are given expression in how the technology makes people use their minds and bodies, which of our senses it amplifies and which of our emotional and intellectual tendencies it disregards.

For those who believe that new technologies are a blessing, Postman (1995) reminds them that for every advantage that a new technology offers there is always a corresponding disadvantage. He believes that policy makers and educators should be careful in unabashedly and relentlessly praising the wonders of computers and introducing them into the classroom. Postman argues that technology cannot substitute

for human values; thus, the emphasis of education should be on human values rather than the use of computers that create a technocratic mindset. He warns that just as democracy without ethical values results in chaos similarly technology without moral underpinnings becomes chaos. For example, knowledge of nuclear fission can produce a bomb and at the same time help generate power to heat houses or produce medicine to heal people. A third line of reasoning in this respect is evident in the work of critical scholars like Peter McLaren. He raises concerns about the assumed ideological neutrality of technology. According to McLaren (2003), this assumed neutrality cloaks the neo-liberal economic ideology that is behind the introduction of computers in the educational realm. As he puts it:

> A particularly serious problem with the technocratic mentality is its appearance of objectivity and value-neutrality. What its adherents don't tell you is that a hidden political agenda oftentimes informs new policy and program directives. Our classrooms need theory, but not the life-obstructing theories that are embedded in a technocratic worldview. We need theories that provoke teachers to question the value assumptions that underlie their technocratic cultural terrain and throw open to scrutiny the classroom practices and social relations linked to capitalist law of value that future teachers are forced to acquire during the course of their teacher education (2003, pp.238-239).

McLaren, like Postman (1993), is not opposed to technology as such but he is alarmed by the 'technocratic mentality' that has infiltrated education with the increasing rhetoric about using technology in classrooms. Again like Postman, he warns us about the

dangers of technology without any critical reflection. Postman (1993) terms this phenomenon as technopoly or 'totalitarian technocracy', i.e., a state where technology

> ...eliminates alternatives to itself ... It does not make them illegal. It does not make them immoral. It does not even make them unpopular. It makes them invisible and therefore irrelevant. And it does so by redefining what we mean by religion, by art, by family, by politics, by history, by truth, by privacy, by intelligence, so that our definitions fit its new requirements (p.48).

Others, like Ursula Franklin (1990), urge us to pay close attention to the objectives of any new technology, which according to her are embedded within the technology itself. These objectives become non-negotiable once the technology is created. Nobel (1997) analyzes the obsession with technology as a manifestation of human desire for the extension of life and denial of death. He argues that technology has obtained a quasi-religious status in the current era. Like Apple, McLaren, and Postman, he views technology as a means of social control and argues that introducing technology in education is not really about education at all but an investment opportunity in the education industry by the market (Noble, 2002). In *Digital diploma mills: The Automation of Higher Education*, he examines how teacher autonomy is being undermined, and the quality of education being compromised through distance education programs (Noble, 2002). Once faculty and courses go online, administrators gain much more direct control over faculty performance and course content than ever before, with the result that the potential for administrative scrutiny, supervision, regimentation, discipline and even censorship increases dramatically.

Technology and Human(istic) Values

Another line of thinking that runs through many strands of the critical theory of technology is that the current discourse on technology in education obscures the link between technology and human(istic) values. Critical theorists of technology vehemently argue that if technology is to benefit society in general and education in particular then this vital link has to be explored and made the focal point of such introduction. For example, in order to avoid the 'technocratic worldview or totalitarian technology', as McLaren and Postman caution, Nicholson (1995), argues for the need to develop a humanistic model of curriculum instead of a techno-centric one whenever technology is being introduced into schools. Nicholson (1995), makes a distinction between the two by arguing that the latter provides learners with only the necessary skills for their vocational future and is based on learning about technology in order to meet the perceived needs of industry. Such a techno-centric curriculum has also been questioned for its inability to create knowledge beneficial for learners by academics and philosophers like Naisbitt (1984) and Dertouzos (1989). The humanistic model on the other hand treats the computer as a learning tool just like a pencil; not as an isolated class or subject but as a tool which helps children enhance their thinking skills and seek various alternatives to solve problems. Leventhall et al., (1993), support the use of technology as a tool to enhance learning rather than as the object of learning itself. Nicholson (1995) stresses that, in order to develop a humanistic curriculum, a shift is necessary from 'learning about the machine' to 'using the machine in learning'. By switching from a techno-centric curriculum to a humanistic curriculum the focus shifts from machine to learner,

from acquisition of limited skills to construction of knowledge; from teacher dependency to independent inquiry.

Critical use of technology in education

It is important to note that the critical theorists of technology are not opposed to the introduction and use of computers in education *per se*. What they forcefully suggest, however, is that empirical evidence and the reality on the ground be carefully studied before making decisions regarding the introduction of computers in education. A number of scholars in this tradition argue on the basis of empirical evidence, gathered through long and painstaking research that the assumed automaticity of the link between technology and advancement in learning is at best fallacious. In other words, the introduction of technology does not automatically guarantee enhanced learning or effective teaching. For example, Stanford historian of technology in education Larry Cuban' s work (2001) is based on his research in the pre-schools, kindergartens and secondary schools of computer-rich Silicon Valley. Cuban found no evidence that computers enhance learning. In his earlier works Cuban (1986) traced the history of technology in the education system and a pattern of failed expectations associated with the use of technology[17] in the classrooms since 1920's. He has argued that each time the cycle has begun with big promises backed by the technology developers' research and each time excuses were made in the name of lack of availability of funds. Only a few

[17] Larry Cuban, a professor of education at Stanford University and a former school superintendent has written extensively about the pros versus the cons of the use of technology in education. In *Teachers and Machines: The Classroom Use of Technology Since 1920* (1986) he traces the use of technology since 1920s and observes how successive rounds of new technology failed their promoters' expectations. He believes that the promises about the use of computers may also be a phenomenon of history repeating itself.

people question the claims of technology advocates till new technology comes in and is sold with new promises to the schools to start the lucrative cycle all over again.

While Cuban doesn't see computers as the solution to educational problem, he does not reject their use in education either. He however warns that it is extremely important for the teachers and students to understand that a number of current practices have to change18 if the potential of technology is to be achieved. Means, Penuel and Padilla make very similar arguments in their book, *The connected school: Technology and learning in high school* (2001). Like Cuban, they are not opposed to the idea of using educational technology. However, they argue that mere purchase of equipment and installation of cables cannot make any difference in student performance. The actual factors that bring about any positive change are in fact good leadership and skilled teaching rather than computers. Fullan (1989), Morgan (2000), and Watson and Tinsley (1995) also emphasize the need for teacher training for successful integration of computers in schools.

Cuban's arguments can be compared with those of Clifford Stoll (1995), where the latter criticizes the use of technology especially the Internet in education. Stoll relates the hype about Internet to the myth about 'snake oil' the anecdotal oil that is said to cure many diseases. He believes when proponents of communications and educational

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[18] Cuban raises a number of issues that have to be resolved before any good can be gained from the use of technology. All these issues require a deep and careful reflection on the role that technology will play in education. For example he says, "we have to ask what do we want the students and teachers to achieve in the classroom from the use of information technologies?" "What are our goals?"(At the same time keeping in mind that there are many overlapping and conflicting goals embedded in practitioners', administrators', and policy-makers' desires for more and better use of computers in schools). He also renders the slogan of "computer literacy" problematic as this concept has meant different things at different periods. In addition he differentiates between "computer-assisted instruction" (CAI), "computer-managed instruction" (CMI), and "computer-enhanced instruction" (CEI).

technologies speak of endless opportunities and educational experiences they are offering the society a myth similar to snake oil. He argues that educational technologies are leading us away from sound educational practices.

Furthermore, for Stoll the world on the Internet is a technological fabrication, which he fears is being substituted for reality. He argues that computers are frustrating and costly that they distract from real learning; the use of computers in the classroom inhibits critical thinking and creative thought and can never replace a quality teacher. Stoll (1995), like Cuban (2001) and Means et al. (2001), is not totally pessimistic about technology. Rather, he acknowledges that there can be some benefit from technology if applied properly. Shanks (2000) makes similar arguments about the misuse of computers in the classroom. He is particularly critical of the tremendous expenditures being made to get computers into classrooms.

At the same time, the use of technology entails an inevitable extension of working time and an intensification of work as faculty struggle at all hours of the day and night to stay on top of the technology and respond, via chat rooms, virtual office hours, and e-mail, to both students and administrators to whom they have now become instantly and continuously accessible. The technology also allows for much more careful administrative monitoring of faculty availability, activities, and responsiveness.

Healy (1998), a longtime educator, administrator, psychologist, and interestingly, a fan of computers, is disappointed that so many people in and out of education hold the almost religious conviction that computers in classrooms equal better learning experiences. She argues that computers cannot address the central issues of a child's development and can in no way guarantee the cognitive skills that are needed to develop

into a healthy, autonomous adult. Analyzing the educational software being used, Healy (1998) notes that a wrong message is being sent to children. As she puts it:

> So what you have is a child, then, who comes to the computer, expects a reward [and] then goes into the workplace and expects to get rewarded...somehow we have got this idea in developing software that the way to make kids want to learn is to make it always fun and to make them always feel successful.

She argues that through the use of such computer programs the internal motivation to attack a problem for the sheer fun of challenge is eliminated. Healy (1998) notes that computer technology can be of use in an age-appropriate educational structure, but only with the presence of a teacher to guide the students.

Talbott (1995) argues that unexamined acceptance of technology can lead to an internalization of the logic and rationality of the computer into human consciousness. He believes that technology is fragmenting our connections with the world and causing a loss of the sense of community. Computerization in education especially tends to abstract things from their concrete connections, thus taking away the meaningfulness of the connections. He is also critical of the current rush both to bring computer technology into the classroom (especially advocacy for introducing computers into elementary school classrooms) associated with Seymour Papert (1980, 1993), and the use of the Internet and other network communications technologies.

Social and economic costs of technology in education

Another point of critique of the current advocacy of computers in education by the critical theorists of technology focuses on the ignorance of the economic, social and ecological costs related to such introduction. Oppenheimer (2003) criticizes the current

enthusiasm over computers in education. His main concern is with the cost of putting computers in the classrooms, for he fears that the social sciences, humanities and subjects like art, music and physical education are being compromised to buy computers for the schools. Oppenheimer is not opposed to computers but he firmly believes that these should not be forced on small children. He also believes that the computer skills needed in an average job can be learned in a short period of time. Therefore, he sees no point in the hype about getting classes wired at the expense of ignoring basic values in education. The notion that allocating scarce educational resources to technology will undermine the quality of education is also shared by Robins and Webster (1989) and H. I. Schiller (1996).

Bowers (2000, 1997, and 1998) points to the difference between Western technologies and more ecologically sound cultures and the tendency of modern technology to commodify relationships. He notes that the use of computers not only affects language and thought patterns but also brings with it cultural assumptions that threaten diversity and sustainability. He believes that there is a great need for further research into how technology affects language, metaphor, and attitudes, and how the use of computers makes a moral, political, and environmental argument that affects the social world.

Bowers argues that the omnipresence of computer instruction mirrors the technocratic mindset of the twentieth century, which promotes a worldview of the individual as autonomous and self-directed (Bowers, 1998). This view, according to Bowers, has created a serious ecological imbalance, nuclear threat and a loss of our sense of community. Elsewhere Bowers argues that an educational reform based on the computer-

mediated or cultural wars waged by modern liberals and conservatives will not help any society. He proposes the alternative of eco-social revitalization of education and culture as a solution to the problems of the modern age (Bowers, 1997).

Analysis of the Debate

So what is it about the educational use of technology in schools that has created two very different points of view among those concerned with the future of education? An analysis of the debate between the techno-advocates and critical theorists of educational technology reveals that among those who are critical of the use of technology in education there is only a handful of scholars who are totally opposed to the use of technology within classrooms (Stoll, 1995; Sanders, 1995, and Birkerts, 1994) and who hold the view that computer-based environments for education will lead to a decline in reading and writing skills and individuals' ability to concentrate over sustained periods, thus resulting in social alienation, rise in violence, etc. In contrast to these, the majority of critics do not reject the use of computers in education (Healy 1990, 1998; Provenzo 1991; Irwin &Gross, 1995). How then does one discern the differences between the critical theorist and the advocates of technology for education?

The foremost difference between their respective positions can be seen in terms of their epistemological and ontological stance on how they see technology and the role of education in a society. The techno-advocates derive their knowledge from the instrumentalist theory or technology-led theory of social change that views technology historically as a main force in moving society forward. Thus, they see technology as the fundamental condition underlying the pattern of social organization and progress. Seen

from this point of view, introducing computers in schools can help students and teachers to accomplish more in less time.

At the same time, techno-advocates subscribe to the neo-liberal ideology that tends to explain all aspects of life, including education, in 'cost-benefit' terms. The use of the neo-liberal ideological lens to analyze education limits techno-advocates to seeing the purpose of education from a very narrow perspective. Such a perspective looks at education in terms of economic competition, test scores and skills for employment. This is based on what Freire (1970, 2000) terms the 'banking model' of teaching and learning. Education is seen as transfer of knowledge or skills rather than creation of knowledge relevant to the socio-cultural context of the learner.

Sheer techno-advocacy supports the view that the main goal of education is to produce skilled workers to enhance national productivity. Techno advocates deem efficiency, access to more information, technical skills, computer literacy[19] as the new 'raw materials' for a global economy. Taking an apolitical view of technology, they believe, can help improve educational structures and systems of education immensely. Winner's (1986) term "mythinformation' can be used to sum up techno-advocates' views on technology and education. Winner (1986) describes 'mythinformation' as "the almost religious conviction that a widespread adoption of computers and communication systems along with easy access to electronic information will automatically produce a better world for human beings" (p.105).

For critical thinkers of educational technology on the other hand, human factors and social arrangements, issues of power and justice and the ways in which economy, race,

[19] Techno-advocates do not define technical literacy in critical terms, the ability of the student to use computer is seen as technical literacy.

gender, ideologies, discourses, curricula, education, religion and other socio-cultural institutions interact to construct the social system need to be studied before making any claims that introduction of technology will lead to any improvement in education. Technology for them is secondary to educational goals and human existence. Thus, their concerns are with respect to what technology can undo rather than what it can do. Critical thinkers of educational technology are concerned with the apparently simplistic and unproblematic approach and methods used in introducing technology in schools. They argue that the introduction of educational technology replicated on a business-like model or driven by economic ideology can add to the list of forces that keep individuals or groups from controlling the decisions that significantly shape their lives. Critical thinkers of educational technology argue that the main aim of introducing technology in schools should be to focus on knowledge creation and the empowerment of learners.

Critical theorists of educational technology also argue that any presentation of technology in unproblematic terms, "as something autonomous, having a life of its own and driving the modernization process" (Peters, 1996. p, 143), provides a very linear notion of progress that restricts social vision and the need for reflection. It is important to understand that most critical thinkers of educational technology are not against the use of technology as an educational tool. Rather, they merely point out that the manner in which technology has been appropriated in educational institutions so far is likely to produce inequality. Education is a basic human right and as such the goals and aims of educational institutions should be to form an equitable and just system. Technology in schools should be introduced to empower students rather than to maintain the existing knowledge/power hierarchy and inequality. Such inequality has been produced by

concealing the political nature of technology and by narrowly imagining education's role to produce workers for the market. Critical thinkers of educational technology point out that it is education for citizenship, political participation, social and moral responsibility, justice and equity that has the capacity to engage people in dialogue and reflection on the constructive, socially relevant and valuable uses of technology and patterns of employment (Hargraves, 1994).

From the perspective of techno-advocates, technology can only help mankind to move forward. They point to the advancements of medical science and how it has extended human life, how transportation technology has made distances shorter etc., as evidence that technology is the harbinger of change. Thus, when it comes to introducing technology in education they are strong advocates of the use of technology for educational purposes. Technology is considered neutral in the sense in which other tools, such as pencils or chalk, are seen as neutral tools.

In contrast to this position, for critical thinkers of educational technology, "embedded in every tool is an ideological bias, a predisposition to construct the world as one thing rather than another, to value one thing over another, to amplify one sense or skill or attitude more loudly than another" (Postman, 1993,13). Seen from this angle, computers are capable of creating new conceptions of what is real and for critical thinkers this poses an important question, i.e., what new conception of reality is the technology creating and whose purpose does it serve?

Both perspectives view education very differently. For while essentialists/advocates/ technophiles see the main purpose of education as developing skills in students and

preparing them for the labor market–in other words, *technical* and *practical* [20] knowledge, critical thinkers of educational technology emphasize the use of technology for '*emancipatory*' or '*directive knowledge*' in education. For critical theorists, such knowledge can only be gained by directing sustained attention to the contemporary world; by looking to transcend the given social conditions, by taking nothing for granted. Introduction of technology in education, critical theorists of educational technology argue, educational use of technology must aim at creating conditions where domination, oppression and injustice can be overcome and transformed through deliberative and collective action. Technology in education should be used as a tool to increase communication, create awareness, break down existing hierarchies, develop new styles of creating knowledge, and make schooling and education more inclusive. Thus, critical theorists of educational technology question the extent to which mere technical use of computers in education will serve to empower students. They argue for the need for research into the possible effects of systematic imposition of technical ideological perspectives on education. In other words the very idea of using computers for education is not accepted by critical theorists as normal and unproblematic.

[20] Following Jurgen Habermas critical pedagogy makes a distinction between different forms of knowledge. Mainstream education system imparts knowledge in two major forms. First, t*echnical knowledge* based on the natural science model, i.e. what is measurable and quantifiable and can be empirically proven. Giroux has termed this as *productive knowledge*. Second, *practical knowledge* based on the study of events and social situations historically to help individuals understand current social situations. While technical knowledge leans towards usage of quantitative methods, practical knowledge is based more on the use of qualitative methods. Critical pedagogy is interested in a third type of knowledge, i.e. what Habermas terms as 'emancipatory knowledge' and what Giroux calls the 'directive knowledge'. Emancipatory knowledge seeks to reconcile and transcends the opposition between technical and practical knowledge.

Another difference that distinguishes techno-advocates from critical theorists of educational technology is in terms of their estimation of the benefits that technology can bring to the consumers of technology. While the advocates of technology look at the benefits that technology has to offer without looking into the equity side of the argument, the critical thinkers of technology argue that the benefits and deficits of technology are not equally distributed and that, as a consequence, technology benefits some more than it benefits others. They argue that technology is frequently employed to reinforce existing dominant interests (Street, 1992; Winner, 1986, 1996). Critical theorists of educational technology point out that technology has increased the power of large-scale organizations like the armed forces and multinational corporations. They question the extent to which computer technology has been of advantage to the common people. Similarly, they question the extent to which placing technology in schools will serve business interests and the advantages it will offer to teachers and learners.

Techno-advocates emphasize the advantages that technology can offer to modernize education. They argue that computers promote both independent and collaborative work, help students in self-direction and independence, provide learners with more flexibility, and allow immense flow of information, autonomy, and confidence. Critical thinkers of educational technology respond by pointing out that computers are also capable of altering thought processes and have the potential for several negative tendencies such as: isolating and minimizing social interactions, and a resulting loss in creativity (Oppenheimer, 1997); inducing escapism, withdrawal from social engagement (Mander, 1978); encouraging obsessive and compulsive behavior (Turkle, 1984); weakening the family, undermining communities, deskilling teachers and using up valuable funds and

time as they become more complex, only to become obsolete on a regular basis within a few years (Apple, 1986; Winner, 1996; Sclove 1995).

Above all, critical theorists of educational technology point out that computers promote a certain kind of worldview based on an element of 'hyper-reason', i.e., a tendency towards obsession with the means rather than with the ends. According to them 'hyper-reason' serves as an oppressive force by focusing on the interest in method and efficiency rather than the purpose and spotlighting questions related to 'how to' rather than the more important questions of 'why should'. Therefore, the benefits of the introduction of computers into schools, for critical theorists of educational technology, remain unclear. For the advocates, introduction of computers in schools will necessarily result in improving the quality of education. For the critical thinkers of educational technology, the mere addition of computers in schools will neither solve the existing problems faced by educational systems nor improve the quality of education. They point out that a number of basic philosophical questions about what counts as 'education and knowledge and whose purpose does it serve' need to be answered before computers are introduced into schools. In the end, it will be the answers to the questions of 'why should' computers be introduced in schools that will determine the methods used to introduce technology. It is the manner, the method, the way technology is introduced in schools that will determine the educational potential that technology has to offer and not just the placement of hardware and software in school laboratories.

Situating my Research

My research interest lies in trying to understand what kind of educational possibilities the introduction of technology in Pakistani public schools can offer to the general public

of Pakistan. The preceding review of the literature provides me with important insights in conceptualizing and linking technology with education. It especially helps me in linking the educational use of technology to the acquisition of what Nicholson (1995) terms as 'humanistic' education. It also provides me with a number of important insights that are necessary to ensure that technology serves as a tool to create relevant knowledge rather than as a mere technical add-on in the schools.

Critical theories of educational technology focus my attention on contextualizing the use of educational technology in accordance with the socio-cultural and political environments of the society where educational technology is being introduced. Second, they direct me to look at who will benefit from the introduction of technology in schools by looking at what kind of knowledge is being produced and finding out if such knowledge is relevant to the needs of the learners. Third, they direct my attention to look for important issues connected with successful implementation of computers in schools, such as teacher training, funds, curriculum integration, technical support, hardware, software, etc. Critical theorists of educational technology point to the fact that the above-mentioned issues are not only important for the successful and sustainable introduction of educational technology in the schools, but that such related factors determine whether technology will be used to promote techno-centric or humanistic education.

By arguing that there are complex, interwoven, socio-political, cultural, historical, economic and linguistic issues tied up with the seemingly innocent introduction of technology in classrooms, critical theory of educational technology prompts me to go beyond the basic 'good for all' model and use a critical framework to analyze what kind of discourse is being used in Pakistan to introduce technology in public education. How

do educators respond to and relate with the dominant discourse about the use of technology in education? It also encourages me to find different perspectives on the introduction of technology in the public schools and look for any differences between educators' perceptions of technology in education discourse and the official version of the discourse.

The critical theory of educational technology helps me situate the concept of educational computing in a socio-cultural framework. The cultural approach embedded in this perspective informs me that adoption of technology must incorporate the following two elements: (1) understanding of the political context, and (2) assessment of technology that is to be introduced in a particular educational context. From this I draw the conceptual framework of my research, which I elucidate in the next chapter.

CHAPTER 3
CONCEPTUAL FRAMEWORK

Introduction

I have divided this chapter into three parts. In the first part I explain my epistemological stance while in the second I deal with critical theory, critical pedagogy and critical theory of educational technology in terms of their origins, assertions, and evolution. I also highlight important tenets of critical pedagogy and critical theory of educational technology that are imperative for my research. Finally, I map out how a critical theoretical framework inspired by critical pedagogy and critical theory of educational technology informs my inquiry.

Qualitative epistemologies

Before I begin explaining my theoretical framework, let me briefly explain the epistemological stance of my inquiry. Three basic philosophies that guide the aims and methods of qualitative research are interpretivism, hermeneutics and social constructionism. The over-arching philosophy of knowledge that sets limits and defines the road map or the blue print of my research lies in the last mentioned of the three.

Social Constructionism

At the very core of social constructionism is the idea that knowledge is not out there to be discovered by the researcher; rather, it is constructed. This construction of knowledge takes place within a socio-cultural and historical setting through a complex mix of concepts, schemes and models employed in language both by research participants and the researcher. The interpretations made by the researcher are also dependent on a backdrop of shared understanding of culture and language. As Potter (1996) explains,

constructionism in the tradition of conversation analysis argues that reality is socially constructed; "the world...is constituted in one way or another as people talk it, write it and argue it" (p.98).

Epistemologies of social constructionism and philosophical hermeneutics overlap in supporting the view that any understanding of the human world is disclosed through the use of language. But this consensus about the importance of language in providing such understanding quickly breaks down between the two epistemologies as hermeneutics posits trust in the potential of language to unveil truth to the matter of interpretation. Hard core constructionists, on the other hand argue that, "there is no truth to the matter of interpretation" (Denzin & Lincoln, 2000, p. 198). At the core of social constructionism is the belief that knowledge is not discovered by human beings but is rather constructed by them. Concepts, models and schemes are devised to make sense of the experience, and this is negotiated in socio-cultural and historical contexts by making use of a common language, shared understandings, and practices.

Hence knowledge can never be disinterested, apolitical or free of the researcher's emotions, for, as Rouse puts it, "in some sense it is always ideological, political, and permeated with values" (1996, p. 198). It is argued that the "real relations" of a particular society cannot be experienced outside its cultural and ideological categories. However this is not a nihilistic stance, as it does not totally nullify the interpretations made by those who are not familiar with the language, beliefs, values and context of research, rather what is suggested is that acquaintance with cultural and ideological context can lead to better interpretations.

Taylor (1980) argues that some interpretations can be better than others. A better interpretation is the one that provides superior clarity both for the researcher and research participant and since context, beliefs and values affect our interpretation of events therefore a researcher sharing the same context, beliefs and values of the research participants may be able to provide a better interpretation than the one who is not *in situ*. However, sometimes outsiders can see things that insiders are either too close to see themselves or are not aware of, or not willing to discuss. Therefore, Taylor's argument does not rule out the possibility of insightful observations by outsiders (Taylor, 1980).

With respect to my epistemological stance, I believe that neutrality of observation, *a priori* experience, and independence of data from the influence of theoretical framework is not possible. I believe that context, beliefs, values and practices play an important role in any understanding of human action. At the same time, mere understanding of the context alone is not the defining characteristic to provide 'good' interpretations about a society. I contend that a combination of contextual understanding along with philosophical and theoretical reflection can lead to a relatively 'good' interpretation or understanding of human action in particular contexts[21].

However, I believe it is important to make a distinction between social constructivism and social constructionism. Social constructivism is primarily concerned with the influence of social process on the individual's psychological construction of meaning-making. A constructivist epistemology locates learning and meaning-making as a cognitive process and therefore makes the 'cognitive' rather than the 'social' the ultimate reference point. As Bonk (1998), Crook (1994), and Howe (2000) explain, the

[21] I have discussed the issue of insider or outsider with regards to my role as a researcher in the context of Pakistan under my methodological issues in chapter 4.

assumptions of social constructivism about individual learning still underpin its worldview. Such a focus on individual learning prevents practitioners from incorporating completely the socio-cultural dimension in their final analysis. Social constructivists do acknowledge the social dimension of knowledge, but they ultimately turn inwards to, "epistemological considerations that focus exclusively on the meaning-making activity of the individual mind" (Crotty, 1998, p.58). In contrast to social constructivists, social constructionists unequivocally turn their attention and focus away from the individual mind towards society and, "to the world of inter subjectively shared, social constructions of meaning and knowledge" (Schwandt, 1998, p.240).

My epistemological stance is influenced by Maguire's (1996) concept of the *nested contexts,* i.e., "shifting social, cultural, linguistic, economic, and political boundaries that intersect, overlap and collide with each other in complex ways" (p. 220). With Maguire (1996, 1997), I argue that reality is constructed socially; it is multiple because different people construct different realities. Particular histories, experiences, social class, gender, language, time and location of the people who are in turn constructing reality influence the process of construction of reality. Furthermore, since I am a human being going out into the field and trying to make an 'interpretation of interpretation', all the factors mentioned above will also apply to my perception of the interpretation of my research participants.

I believe that knowledge is constructed through social activity, that meanings are created through dialogue between groups of people. I agree with Crotty (1998) that all knowledge and meaning-making "is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and

transmitted within an essentially social context" (p. 42). Thus, my social constructionist epistemology prompts me to look at peoples' knowledges and interpretations neither as the expression of their internal cognitive processes nor as a representation of 'truth' but as a way in which they interact with each other and attach meanings to different things according to their own life experiences.

I also believe that people's life experiences are shaped by the historic conventions of their culture and language. However, the life experiences of people cannot simply be reduced to the influence of culture, history and language. Politics and ideology also play an important role in shaping life experiences, thus influencing the meaning-making practices. Therefore, it is important to acknowledge that there are multiple ways of constructing meanings and that power (ideology and political interests) plays important role in the meaning-making process.

Having stated my epistemological stance I now describe the conceptual framework that informs my inquiry. Qualitative inquiry binds inquirers through a general opposition of foundationalist- empiricist-representationalist focus; it is a contentious field for qualitative researchers with respect to consensus on the goals and aims of social inquiry. Some neo-pragmatist, critical theorist, and feminist qualitative researchers define the goals and aims of social inquiry as transforming and critical of unjust and undemocratic educational and social practices, and thus focus more on political transformation (Howe, 1998).

Others believe in the power of critical reflection through the process of conversation and dialogue. They believe understanding is only possible through dialogue and participation in tradition (Grondin, 1994). Yet others, such as postmodernists, are

extremely doubtful either of the emancipatory goals of neo-pragmatist, critical theorist, and feminist researchers or of the conversational framing of the interpretative project. They choose as an alternative the path of continual interpretation that untangles the multiple meanings of the notions of objectivity, subjectivity, truth, self and being. I draw my conceptual framework from arguments put forward by critical pedagogy and critical theory of educational technology. Both these theories fall under the larger umbrella of critical theory and can only be understood within the context of critical theory's main goal of social inquiry, which relates to transformation of unjust and undemocratic social practices. In the following section I provide a brief account of critical theory.

Critical theory

Critical theory draws on a number of diverse sets of ideas and ideologies, such as those of Marx, Kant, Hegel, Weber, the Frankfurt School theorists, continental social theorists such as Foucault, Habermas and Derrida, liberationist educators such as Paulo Freire, French, post-colonial theorists and feminists of color and Russian literary critics such as Bakhtin and the developmental psychologist Vygotsky. Like all other theories, critical theory does not constitute a unified version and has shifted in terms of both its goals and focus as it has evolved with time. However, it can be generalized that, at its very core, critical theory was and still is concerned with the issues of power and justice and the ways in which race, gender, ideologies, discourses, education, religion and other socio-cultural institutions interact to construct the social system.

Historically, the roots of critical theory are associated with the Frankfurt school theorists,[22] who proposed that a different conception of social science was required, from

[22] What distinguishes the Frankfurt School from the earlier Marxist theorists is that:

an analysis based on an aggregate of mechanical determinants and a value-free conception of social reality. Another point of departure from the earlier theories of society was a conscious emphasis on engagement with the process of social transformation. According to Morrow and Brown (1994), radical (critical) theory owes its unique characteristics to the works of Horkheimer (1895-1973), Adorno (1903-1969) and Marcuse (1898-1979).

Morrow and Brown (1994) trace a number of phases in the development of critical theory. In its first phase, the main concern was still with factors that could contribute to the development of a revolutionary working class. Interdisciplinary materialism was used for analysis and Marx's economic reductionism was rejected. In its second phase (the late 1930s), with the new found stability of capitalism, critical theory was marked by a shift in emphasis from materialism to exploring the effects of the rise of the welfare state and mass media (culture industry) in distracting the working classes. In its third phase, critical theory was influenced by the work of Habermas, who reworked critical theory to guarantee its application to the critique of advanced capitalism (Morrow and Brown, 1994).

In its evolution over the last 20 years critical theory has come to reject the earlier emphasis on economic determinism and now acknowledges multiple forms of power and authority. In so doing, however, it does not go so far as to postulate that economic factors are unimportant in shaping every-day life or that they can be separated from other spheres

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"It was the first independent research group that was able to work within an avowedly Marxist framework (though it eventually would break with key aspects of orthodox Marxism). It was open to the interdisciplinary appropriation of theories and methods from the social sciences, humanities, and non-Marxist philosophy. It represented the first systemic effort to employ traditional empirical research techniques (e.g., survey research) to the refinement and testing of propositions derived from Marxist tradition" (Morrow and Brown, 1994, p.15).

of oppression (Carlson, 1997; Hull & Lanksher, 1996; Gibson, 1986; Kincheloe & Steinberg, 1999).

At the present time, critical theory is associated with a number of theorists spread over different disciplines. These include critical pedagogy and critical theory of educational technology. The influences of the earlier tradition remain but many critical theorists are now more concerned with recent developments in society than debates in classical sociological theory.

Critical theorists such as Carter (1998); Kincheloe & Steinberg (1997), and Sleeter and McLaren (1995) emphasize the need to study the power interests of privileged groups. These groups support and maintain the status quo so that the system can work to their advantage. Power struggle in this sense is evident in the realms of race, class, gender and sexuality. Critical theory attempts to uncover ways of thinking or constructions of ideology that submit to the dominant power relations. Over the years, critical theorists have increasingly turned their attention to music, entertainment, and what Adorno (1903-1969) called the culture industry as forms of oppression intended to calm down and restructure any radical social tendency. Critical researchers aim to expose the forces that keep marginalized individuals or groups from controlling the decisions that significantly shape their lives while acknowledging the fact that complete emancipation from the socio-political context that produces these individuals is not possible.

It is important for me to acknowledge that critical theory is not without its devout set of critics. Like any other theory, it has been a target of criticism from a number of intellectual positions. These critiques accuse critical theory of being elitist, over rationalistic and antiscientific. Critical theory has often been reprimanded as too elitist

due to its emphasis on reflection and philosophizing about social issues. One of the reasons for this accusation can be critical theory's emphasis on asking new kinds of questions and using philosophical tradition for rethinking the grounds of social theory. Furthermore, critical theory's so-called antiscientific stance has especially been a target of criticism. Critical theory rejects sociology's ability to measure social facts and develop general laws in 'natural scientific terms'. It does not choose or prefer any specialized 'empirical research program' in the conventional sense. As a result it is often accused of being irrelevant to empirical research altogether. Critical theory has also come under attack for being overly idealistic and theoretical (Ravitch, 2000) and therefore too ideological and not appropriate to study social science. Critical theorists like Morrow and Brown (1994) argue that ideological assumptions of critical theory should be seen as its strength rather than a weakness. They argue that ideological assumptions are made explicit in critical theorizing and therefore can be debated, "in terms of legitimacy of values they embody and the social forms through which they might be brought to life" (p.27). The task of critical theory, Morrow and Brown (1994) argue, is, "...not to defend some kind of abstract objectivity...to affirm the basic autonomy required...for transformative praxis" (p. 27).

As I mentioned earlier, critical theory is associated with a number of theorists spread over different disciplines. Critical theory's influence in the discipline of education has resulted in the development of critical pedagogical theory or critical pedagogy and critical theory of educational technology. In the following space I discuss my conceptual framework based on a synthesis of elements of critical pedagogy and critical theory of educational technology. I also discuss some important tenets of critical pedagogy and

critical theory of educational technology that inform my inquiry and provide the base for my conceptual framework in this research.

Critical pedagogy and critical theory of educational technology

> [Critical] pedagogy . . . signals how questions of audience, voice, power, and evaluation actively work to construct particular relations between teachers and students, institutions and society, and classrooms and communities... Pedagogy in the critical sense illuminates the relationship among knowledge, authority, and power (Giroux, 1994, p. 30).

The radical theories of education sometimes also referred to as 'the new sociology of education', 'critical theory of education' or 'critical pedagogy' have emerged mainly in the last 20 to 30 years. Critical pedagogy has its roots in critical theory; both share common philosophies and approaches. Critical theory is concerned with how society's dominant discourses, with their ideological and hegemonizing power, socialize people and shape their life experiences. This is the starting point for critical pedagogy. Just as critical pedagogy evolved from the well-established discourse of critical theory, critical theory of educational technology shares its contextual territory and goals with critical pedagogy.

I believe these three theoretical premises, namely, critical theory, critical pedagogy and critical theory of educational technology, share broader goals and aims. All three are mainly concerned with investigating institutional and societal practices and all these seek ways of resisting the imposition of dominant social norms and structures. Critical pedagogy can be distinguished from critical theory in that it focuses on educational practices and strategies to respond to oppressive power relations and inequalities existing

in educational institutions. Like critical theory, critical pedagogy focuses on issues related to opportunity, voice and dominant discourses. However, the context of investigation is not the workplace but educational institutions.

Similarly, critical theory of educational technology retains all the aims and goals of critical pedagogy, except that the context of investigation is technology. The possibilities that technology can offer in an educational context either as a tool of imposition of dominant social norms and control or as an educational tool for equitable and liberating educational experiences for learners. Critical theory of educational technology interrogates how educational institutions appropriate technology. It is concerned with finding out ways in which technology in education, rather than becoming a tool of oppression and means of control, can lead to raising critical awareness in learners so that they can transform the world.

Both critical pedagogy and critical theory of educational technology acknowledge the importance of the dynamic inter-relationships between different players in the learning context and seek to examine various external influences on the process of learning. Critical theory of educational technology takes into account the local as well as global factors that influence the use of technology in education.

Critical pedagogy looks at schools both in their historical contexts and as a part of the existing social and political fabrics that characterizes the class-driven structure of society today. It points to the fact that power and politics play a central role in how schools work. As such, this theoretical orientation critically examines the political economy of schooling and the systemic influences and relationships between and within the state and education, the representation of texts, and the construction of student subjectivity.

To begin with, critical pedagogy regards specific belief claims not as propositions to be evaluated for the truth of their content, but as parts of systems of belief and action that have aggregate effects within the power structures of society. It first asks questions about the systems of belief and action; who benefits from such a system? The primary preoccupation of critical pedagogy is with social injustice and how to transform inequitable, undemocratic, or oppressive institutions and social relations. It gives primacy to the social, the cultural, the political, and the economic in order to understand better the working of contemporary schooling.

Schools are seen not only as instructional sites but also as cultural arenas where heterogeneity of ideological and social forms often clash in a constant struggle for dominance. Schools are therefore analyzed by the critical pedagogists for the multiple roles they play. In this way schools are seen as both sorting mechanisms where selected students are favored on the basis of race, class, and gender and also as actual and potential arenas of agency for self and social empowerment.

Traditionally, it is assumed that schools function as a means for the development of democratic and egalitarian societies. Critical thinkers (Allman, 2001, 1999; Giroux, 1994, 1997, 1988; Macedo, 1994; Hill, 1999; Cole, 1989, 2000 and Brosio, 1994) have argued otherwise. By analyzing schooling as a cultural and historical process and closely looking at school curricula, knowledge construction and policy and its dependence and/or connection with the corporate marketplace and the fortunes of the economy, critical pedagogists have demonstrated that all educational issues–such as, what counts a literacy, knowledge production and acquisition, excellence, evaluation or accountability–are

informed and influenced by the social, economic, and institutional contexts in which schooling takes place.

Mainstream schooling thus becomes an auxiliary system that supports the unjust bias resulting in the transmission and reproduction of the dominant culture. This in turn leads to the reproduction of the division of labor in the interest of the ruling class. Thus, critical pedagogy's goal is to give ethical priority to schooling for self and social empowerment rather than to the mastery of skills that are tied to the logic of the marketplace. In this sense the aim of schooling is the construction of a society based on non-exploitative relations and social justice, thereby making life qualitatively better for all.

Freire (1990) argued that liberatory education couldn't take place unless a social and political analysis of life is at the centre of the curriculum. This is because authentic knowledge cannot be produced without grounding students' lived experiences in the process of education. Since human beings attach meanings to acts and things through communication and dialogue, the best learning can therefore take place through dialogue. In critical pedagogy a dialogue between students and teachers where the teacher poses a problem to students can lead to the development of critical consciousness.

Critical theorists of educational technology point out that rapid advancement of information and communication technologies has led to a more interconnected world. Thus, the social and political life of learners is no longer confined by geographical boundaries. Connected computer with information from around the globe has now become the new discursive and political location. With technology learners can not only use dialogue to engage in various discussion groups but utilize a number of other methods to enhance their critical consciousness. The meanings of liberatory education

now include not only social and political analysis of the learner's life in the local context but also in the global context.

Critical theory of educational technology focuses its attention on the use of technology in schooling processes. In other words, critical educational theorists are interested in finding out how teaching, learning, knowledge creation and systems of education are affected by the introduction of technology in schools. Their interest lies in exploring ways in which the educational use of technology can enhance the critical thinking abilities of learners. At the same time critical theorists of educational technology warn about the possible risks that uncritical, un-planned and hasty introduction of technology in schools can cause to the larger aims and objectives of education. Critical theory of educational technology directs our attention towards the fact that, increasingly, technology is being used as the defining aspect of quality education. Just as classical critical theory was concerned with analyzing how technology was 'selectively' appropriated in the capitalist production process, critical theorists of educational technology focus their attention on how technology is 'selectively' being introduced in educational institutions and effects of such hasty introduction of technology on knowledge production. They argue that computers have been introduced in schools without critical reflection or defining educational goals. Critical theory of educational technology studies the new forms of power and authority associated with both 'control of technology' (technology producing developed countries) and 'control through technology' (surveillance/scrutiny).

Critical theorists of educational technology are interested in finding out the possible divides/struggles/knowledge gaps that educational technology can create or fill in their

quest to find solutions to improve the system of education. They argue that the hasty introduction of computers into schools is a result of narrow technology-inspired neo-liberal discourse, which may have significance for business but has limited or no educational significance. Therefore, there is a need for further research and careful analysis of the role of technology and its interaction with pedagogical practices. In their analysis of technology critical theorists remain focused on the main concerns of critical pedagogy, such as education for justice, critical awareness and empowerment. As such, critical theory of educational technology is not only concerned with the role technology plays in knowledge construction, but also in examining the kind of knowledge that is produced by putting technology in classrooms and who benefits from such knowledge.

For example, it is agued that technology's role and importance in education should be evaluated in terms of its ability to act as a catalyst to make the educational system equitable and enhance knowledge that empowers learners to transform their unjust society. As such, critical theory of educational technology aims to seek ways in which technology can help in identifying philosophies, teaching styles and educational organization, which serves educational goals by empowering learners instead of imparting a few technical skills to potential recruits.

It is important to note that by rejecting the notion of the neutrality of technology, critical theorists of educational technology try to bridge the gap between two extreme 'for technology or against technology' views held by many with regards to the role of technology in education. They do so by rendering the use of educational technology in its cultural, social, political and economic context. In other words, critical theory of educational technology argues that use of technology for educational purpose cannot be

seen in isolation from larger socio-cultural and political factors that affect schooling and education. It is argued that that dichotomous model of the 'either/or' position about technology closes the door to the possibilities of discussion about the benefits or harms of the use of technology in education. Proper contextualization of technology within the context of education and contextualization of schools within particular socio-cultural, political and economic surroundings can lead to a better understanding of the role technology can play in the educational systems of particular societies.

Technology has become the defining characteristic of the current era so much so that the computer has become a dominant cultural form. Critical pedagogy refers to empowerment as learners' ability to understand the dominant cultural forms in their social and political context. Using similar criteria critical theorists of educational technology argue that empowerment includes learner's ability to understand possibilities technology has to offer in the local and global, social and political context.

Seen from this perspective, it becomes essential to include technology in educational institutions. However, simply providing access to the new technologies does not guarantee the critical consciousness needed to overcome the divisions and inequalities at both the local and global levels. Critical theorists of educational technology argue that an un-critical and non-problematic approach to introducing technology into schools can enhance the possibilities whereby the act of placing computers in schools itself will increase the current inequalities at both the local and global levels.

They cite empirical evidence showing that there is greater access to computers by developed countries globally, and only to privileged groups in developing countries. At the same time critical theorists of educational technology argue that a well-thought-out

and planned introduction of computers in schools can promote multiple literacies needed to empower students. Such a planned introduction of technology in education will ensure that technology acts as a catalyst to change the existing educational practices from undemocratic and authoritative towards interactive, dialogical and inclusionary practices. However, any planned introduction of computers into the classroom needs to first address important issues, such as the goals of education, social context where teaching and learning takes place, economic considerations, teacher training, technical support, long-term sustainability of technology, appropriate hardware and software, and the capacity of the local context to support technology both in terms of cultural attitudes and resources, before any decision about introducing technology in schools is made.

Important Tenets of Critical Pedagogy and Critical Theory of Educational Technology

Social construction of knowledge.

Critical pedagogists believe that knowledge is socially constructed and is deeply linked with power relations and authoritative discourses. What constitutes knowledge at a given time and in a given society is constructed symbolically in the minds of people through social interactions with others and is heavily dependent on culture, context, custom and historical specificity. Similarly, critical theorists of educational technology argue that various political and business leaders have been socially constructing the importance of technical knowledge. They point to the fact that most decisions to put computers in classrooms have come from business leaders and politicians and not pedagogists[23]. Critical theorists of educational technology point to the fact that more of what constitutes as technical knowledge or technological knowledge is also linked with

[23] See McLaren 2003 for "corporatization and businessification of education"; see also Gamble, 1988 and Pratt, 1992 for a good discussion of the involvement of business in educational decision-making during the Thatcher period.

power relations and dominant discourses and is symbolically created in the minds of people.

Different kinds of knowledges.

Following Habermas (1974), critical pedagogy makes a distinction between different forms of knowledge. Mainstream education imparts knowledge in two major forms: first, technical knowledge, based on a natural science model, i.e., what is measurable and quantifiable and can be empirically proven which Giroux (1979, 1988) terms productive knowledge; and second, practical knowledge, based on the study of events and social situations historically designed to help individuals understand current social situations. While technical knowledge leans towards the usage of quantitative methods, practical knowledge is based more on the use of qualitative methods.

Critical pedagogy is interested in a third type of knowledge, i.e., what Habermas (1974) terms 'emancipatory knowledge' and what Giroux (1979, 1988), following Freire, calls 'directive knowledge'. Emancipatory knowledge seeks to reconcile and transcend the opposition between technical and practical knowledge. Such knowledge calls for viewing the contemporary world by transcending given social conditions and by taking nothing for granted. Critical pedagogy is especially interested in creating pedagogical practices through which emancipatory knowledge can be imparted. Emancipatory knowledge does not stand in contradiction with technical or practical knowledge, but uses the strengths of both in creating conditions where domination, oppression and injustice can be overcome and transformed through deliberative, collective action.

Critical theory of educational technology further elaborates the role of technology in education by making a distinction between techno-centric knowledge and technological

knowledge. The narrow skills-based model meant to impart certain skills and to evaluate students on what they 'can do' rather than what they 'can know' has no scope for the empowerment of learners or authentic knowledge production. Technological knowledge demands learners' ability to read digitized text for the ideological sub-text and the meanings it embodies. Critical theorists argue that to develop technological knowledge, it is important that learning take place *through* computers and not only *about* computers.

Importance of context.

Critical pedagogy points toward social, cultural, historical, economic, psychological, ideological and linguistic factors that play a very important role in knowledge production and acquisition. The total business of pedagogy or "doing school" (Apple 1990; Giroux, 1988; McLaren, 1989) is political, and educators (consciously or unconsciously) are also part of this political act. Similarly, critical theorists of educational technology have argued that it is important to consider the wider socio-cultural context of those schools were technology is to be implemented. Critical theorists (Honey et al., 2000) argue that technology should not be perceived as a solution to educational problems in isolation but rather as one resource in a school's comprehensive plan to address specific educational challenges.

Culture, pedagogy and technology.

Culture as a site of social contestations holds a central place in critical pedagogy. This is due to a number of reasons. First, culture is closely connected with the structure of social relations that produce different forms of oppression and dependency. Second, it is a system of production and reproduction through which different groups define and realize their aspirations through unequal relations of power. Third, culture can be looked

at as a field for class struggle where particular forms of knowledge production, legitimation and circulation are contested (McLaren, 2003). Therefore the concept of culture is central to critical pedagogy's attempt to understand knowledge production and the reproduction of social inequality. Furthermore, the critical theory of educational technology elaborates the role of culture in important issues related to the introduction and use of technology in classrooms. Culture plays an important role in determining a number of issues related to the utilization of technology's full educational potential. Issues such as the need to identify educational goals, the identification of particular learning needs of learners, the calculation of required funds, teacher training needs, issues of curriculum integration, technical support, etc., are contextually and culturally dependent and cannot be addressed outside the context of the particular society where computers are to be introduced into schools.

Cultural forms: symbols and social practices.

Critical pedagogists pay special attention to symbols and social practices that express culture; these are termed cultural forms. Cultural forms do not exist in isolation but are closely linked with the economic structures of any society. For example, it can be said that schooling is a cultural form inasmuch as it is connected with the means of economic production, the making of social values and ideology and the mobilizing of desire. It involves asymmetrical relations of power/knowledge, class, gender and race. Similarly it can be argued that technology has become the defining characteristic of the current era, so much so that the computer has become a dominant cultural form. However, more research is needed to find out if computers can be termed a 'cultural form' in the context of the developing world.

Ideology.

Critical pedagogists argue that the concept of culture cannot be understood without exploring the idea of ideology. According to McLaren (2003), ideology refers to, "the production and representation of ideas, values, and beliefs and the manner in which they are expressed and lived out by both individuals and groups" (p. 205).

Ideology also refers to the worldview and social practices that are accepted as normal and commonsense; it uses standardized vocabulary and is sustained by a particular set of social practices. Critical theorists have analyzed how business ideologies of efficiency and economies of scale have been used to introduce computers into schools. On the surface, ideology provides a framework that helps members of a society to organize their world, but sociologists agree that ideology is associated with the legitimization of a group action and its social acceptance. According to Stuart Hall and James Donald (1986), ideology works as:

> Frameworks of thought which are used in society to explain, figure out, make sense of or give meaning to the social and political world...without these frameworks, we could not make sense of the world at all. But with them, our perceptions are inevitably structured in a particular direction by the very concepts we are using (pp. ix-x).

Different theorists have described ideology differently, Rosenblum and Travis (2002) define ideology as "a widely-shared belief that has been constructed and disseminated by the powerful [that] primarily reflects their experience and functions for their benefit" (p. 279). For Gramsci (1971), the dominant ideology serves the purpose of hegemony. The Gramscian notion of ideological hegemony consists of two central components: the consent given by the masses and the apparatus of state (state-authorized coercive power

that rewards those who submit to dominant ideology and enforces discipline on those who refuse to give consent). Apple (2000) takes the Gramscian definition further and links it to education, arguing that public education reinforces students expectations of rewards and sanctions by legitimating the existing power relations embedded within ideologies; thus, public education acts as a state apparatus to perpetuate dominant ideology. Critical theorists of educational technology have described how ideology and discourse have been used by politicians and businessmen to portray a crisis situation in the economy as a result of educational failure and to prescribe the introduction of technology in schools as a solution to improve the quality of education.

Hegemony.

Maintenance of domination not by force but by consensus in social practices is what the Italian philosopher Antonio Gramsci termed hegemony. This refers to the moral and intellectual control by the dominant class over subordinate classes not through the use of force, rules or regulations but through winning the consent of the subordinate classes to the authority of the dominant class. Hegemony is achieved by the dominant culture through mainstreaming the terms of reference, such as images, visions, stories, ideals, heroes, etc., by creating dreams and desires, by providing a common world view for subordinate groups. The mass media, the state apparatus (such as schools) and other government institutions and state bureaucracies play an important role in maintaining hegemony by supplying the symbols, representations, and practices of social life in a manner whereby authority and the asymmetry of power remains hidden. Just as critical pedagogists see schools as sites where hegemony is both perpetuated and challenged, critical theorists of educational technology view technology as holding the potential for

both the perpetuation and maintenance of hegemony and at the same time as offering possibilities to learners to resist, confront and challenge hegemonic control.

Discourse.

Discourses are words, conversations, arguments or speeches used by members of a community. They are also the frameworks through which the community (and its members) understands itself and the other. Critical pedagogy pays special attention to discourse as a site of power relations. It examines the 'form' and 'function' of spoken interaction and written texts to discover particular ideologies hidden in the particular discourses of a society. Morrell (2004), citing Gee (1999), explains that discourses,

> are inherently and irredeemably political as is the process of acquiring them. They are political because (1) internal to Discourse there are almost always hierarchical positions; (2) Discourses are partly defined in relationships of alignment and conflict with other Discourses; and (3) Discourses are harder to acquire and tension-filled for authentic beginners (p.37).

Critical theorists of educational technology analyze the power of neo-liberal discourse when looking into the hasty introduction of technology in the realm of education. They point out how educational discourse led by an economic agenda has served to set up social boundaries and ways of thinking where the quality of education is now uncritically linked with the increasingly widespread use of computers. They argue that the neo-liberal discourse inevitably affects the views of people and therefore holds a considerable amount of power, though it may appear to be nothing more than a neutral set of arguments about a specific topic.

Importance of curricula.

Apple (1990) and Giroux (1988) argue that the culture of schools has been depoliticized by presenting hegemonic curricula and pedagogies as neutral and value-free Hegemony is also achieved through covert teaching that is often accompanied by more explicit forms of teaching. Critical pedagogists have pointed out that what apparently appears as neutral, unbiased pedagogy, in fact disguises the interests of the dominant class (Bourdieu and Passeron, 1977; MacLeod, 1987). Curriculum, especially hidden curriculum, is another concern of critical pedagogy. According to McLaren (2003),

> curriculum represents much more than a program of study, a classroom text, or a course syllabus. Rather, it represents the introduction to a particular form of life; it serves in part to prepare students for dominant or subordinate positions in the existing capitalist society (p. 212).

Critical theory has called into question the social relations embodied in classroom practices and the presence of such hidden curricula in the form of descriptions and representations in textbooks that benefit dominant groups and exclude subordinate groups. Naseem (2004), through an analysis of curricula in Pakistan, demonstrates how they actually disempower subordinate groups by reinforcing stereotypical ideas rather than empowering them. Critical theorists of educational technology argue that web-based technology, with all its vast resources, can serve as a great educational tool for uncovering 'hidden' or 'not mentioned' topics in the curriculum. However, as they point out, this is only possible if educational technology is utilized in conjunction with an integrated curriculum. Isolating subjects and teaching them as unrelated units tends to present knowledge in an abstract form. Students have difficulty in relating to such disintegrated, isolated and fragmented knowledge. Using technology to teach about

technology does not do much for enhancing the higher order thinking abilities needed for critical reflection. Critical theorists of educational technology stress that it is not the tool that is important but what is being sought using that tool. Thus, the issue of curriculum is one of the most important issues to be dealt with before putting computers in the classrooms. This is the reason why many critical theorists of educational technology (Veen et al., 1995; Tweddle, 1993; Knight and Knight, 1995; Nicholson, 1995) have stressed that curricula innovations and integration should go hand-in-hand with technology implementation in schools.

Critical literacy.

Critical pedagogy makes a distinction between 'critical literacy' and traditional definitions of literacy. Traditionally, literacy has been seen as an autonomous variable, a technical skill involving the cognitive aspect of reading and writing. In other words, like schooling knowledge production and acquisition, literacy has also been viewed traditionally as a neutral tool or skill applied in encoding or decoding alphabetic text (Street, 1993). Critical pedagogists such as Street (1993) and Freire and Macedo (1987) view literacy as a form of cultural politics rather than a mechanical, skill-driven activity. Critical pedagogists argue that learning is a context-dependent activity linked with cultural structures of power in a society and is therefore closely tied with learners' lived experiences. Texts can only be read meaningfully if housed within the social practices of that specific culture.

Such a view becomes very important in exploring the possibilities of technological literacy in a society where technology has not become the dominant cultural form. In addition to making a distinction between technical literacy and technological literacy,

critical theorists of educational technology present the idea of multiple literacies needed to utilize technology as an educational tool. Technical literacy, as one of the many forms of literacy, refers to learners' ability to use computers, or at best to master existing computer programs. It is achieved through a skills and drill model where computers are taught as an isolated subject. Technological literacy refers to a learner's multiple abilities to utilize computer programs and hardware, not only to develop more sophisticated abilities in traditional reading and writing, but also to develop the ability to make meanings by selecting relevant information from vast resources of information. Technological literacy involves criticizing, analyzing and interpreting information, and as such it involves multiple literacies where the learner is constructing meanings and significance while at the same time contextualizing and evaluating the information according to her needs and context. Thus, technological literacy means not only the ability to use computers to perform specific skills but also that of appreciating the untapped potentialities and sources available by making educational use of technology. Technological literacy can lead to the development of local science and technology. Such literacy not only enables learners to read and understand relations of power and domination at both the local and global levels, but also provides a chance of leapfrogging by creating knowledge that is relevant to the context of the society.

How the critical conceptual framework informs my research

The convergence of critical pedagogy and the critical theory of educational technology provide a critical conceptual framework for my inquiry into educational theory, research, policy and practices as they relate to the issue of introducing technology into public schools in a developing country like Pakistan.

My research seeks to address concerns and issues that arise out of the introduction of technology in public schools in Pakistan. I am especially interested in finding out about the interaction of technology and education within the socio-political and cultural context of Pakistani society. Insights from a critical framework encourage me to situate the introduction of educational technology in Pakistan's public education system within the social, cultural, historical, political, and linguistic experiences of the Pakistani society. These insights also lead me to take cognizance of the economic issues that are intrinsically linked to any efforts at the mass introduction of technology in public schools. This emphasis on the importance of the wider socio-political and cultural context provides me insights into how schools in Pakistan function in mediating various political, social or cultural tensions. It also leads me to ask: What ideological values do schools promote? Who benefits from such values? How would the introduction of technology affect the ideological values that Pakistani schools promote?

The critical framework suggests that an analysis of cultural practices and attitudes towards public education and schooling in Pakistan will not only enhance the possibilities for understanding the ways in which inequalities are maintained in Pakistani schools and in the wider society, but also provide my inquiry with important insights as to how the introduction of educational technology based on a critical model can possibly challenge and transform the current educational system in Pakistan.

The idea of social construction of knowledge through authoritative discourses provides my inquiry with a starting point by looking at the dominant discourses on the introduction of technology in education in Pakistan. It also prompts me to examine how the national discourse is linked with the global discourse on the role of technology in

education. The concepts of ideology, dominant discourse and hegemony provide me with important venues to examine the rhetorical statements by political leaders and policy-makers in Pakistan. These concepts allow me to see how a crisis in education is being perceived in Pakistan and what kinds of technical/educational solutions are being proposed to respond to this crisis. My inquiry seeks to discover what kinds of questions are being raised about educational goals and what is being proposed as a possible solution in Pakistan.

The distinction made by critical theorists of educational technology between techno-centric/technical/skills-based knowledge and technological/emancipatory/inquiry-based knowledge helps me to explore what kind of knowledge is currently being produced and what kind of knowledge is being aimed at by the introduction of computers in public schools in Pakistan.

Critical pedagogy and critical theory of educational technology identify the hegemonic practices of schools in the reproduction of social inequality. Drawing important clues from this, my research aims to find out if technology in the context of the Pakistani public educational system will further perpetuate the inequality or whether it can possibly interrupt the cycle of inequality.

My research also draws from important areas and issues identified by critical theorists of educational technology that need to be looked into and planned before going ahead with the introduction of technology in schools. These include the proper evaluation of funding required for sustainable introduction of technology into schools and continued evaluation and monitoring of the educational implementation of technology.

Other important issues include: identification of educational goals; the need to identify the unique learning needs of particular student population; the context of the school; the need for curriculum integration; teacher training; and the need to build collaborative efforts among different stakeholders in order to introduce technology in schools. All such concerns raised by critical theorists of educational technology provide important entry points for my inquiry.

A conceptual framework informed by the critical theory provides me with avenues to challenge the assumptions, practices, and outcomes that have been so far taken for granted by Pakistani educational policy-makers in traditional education policy-making practices. The assumptions behind these practices revolve around defining the main role of education and educational technology as 'competition in the global economy', 'education for economic gains' and 'nationalistic competition'. By stating that the link between technology and empowerment is neither automatic nor universal, a critical theoretical framework enables me to problematize the general orientation of the educational technology policy in Pakistan which operates from such cause-and-effect assumptions with respect to technology and empowerment. This insight helps me to explore questions related to power issues, such as who will benefit most from the introduction of technology in public education.

Use of a critical framework helps me question the normalization of certain pedagogical practices to the extent that they are now seen as unproblematic in the Pakistani context. My inquiry questions the extent to which pedagogical practices there serve to empower or constrain students. My inquiry looks at the effects of the systematic imposition of ideological perspectives on education and educational technology in the

socio-political and historical context of educational policy-making in Pakistan. From the standpoint of critical framework, the important questions are: Who makes the assertions about what constitutes knowledge? Why are such assertions being made at this point in time? Who funds research? Who benefits from the 'findings'? These questions have direct relevance to my research, which asks even more specific questions, such as: Who makes assertions about introducing computers in public schools in Pakistan? Do such assertions differentiate between techno-centric and technological knowledge? How is the public at large receiving these assertions? Does the knowledge created by the use of educational technology empower learners? Does the knowledge created by the use of educational technology have any relevance to the lived experiences of the learners? What kinds of funds are being made available for the introduction of computers in public schools? Where is the funding coming from? What kind of research is being conducted on the introduction of technology in education and if so who is funding that research?

CHAPTER 4

METHODOLOGY AND METHODS

Overview of the Chapter

In this chapter, I explain my use of a qualitative methodology for inquiry into the introduction of computers in the public schools in Pakistan. I have divided the chapter in three parts. In the first section, I situate my research and use of qualitative methodology by drawing from Denizen and Lincoln's (2000) 'seven moments framework'. In the second part, I explain my use of critical methodology and how a critical theoretical framework (critical pedagogy and critical theory of educational technology) informs my methodology and choice of methods. Finally, I discuss the major methodological issues that frame the methodology of my research. In this section I also discuss the tools I used and how they helped me, along with a brief account of data organization and analysis.

Research site and time frame

I conducted my fieldwork in Pakistan. Pakistan has a total area of 803, 940 sq. kilometers and is comprised of four provinces, namely, Punjab, Sindh, Northwest Frontier Province and Balochistan. Each province is divided into administrative divisions and each division is further divided into districts (tehsils/ *taluka)* villages and union councils. My research sites were the cities of Lahore and Islamabad in the province of Punjab. Lahore, the second largest city in Pakistan, has a population of approximately 5.1 million according to the 1998 census. Along with being a historical and cultural city, Lahore is also capital of the province of Punjab. Islamabad on the other hand is the nation's capital and as such all ministries including the Ministry of Education, are located there.

My choice of site selection depended on a number of factors. First, Punjab accommodates about 55.65 % of the country's total population followed by Sindh with 23%, NWFP with 14.35% and Balochistan with 7%. Since many pilot projects are started on the basis of population, there are thus more schools in Punjab where computers have been introduced. Similarly, the Islamabad and Rawalpindi area also boasts many schools where computers have been installed. Thus, it made more sense for me to go to cities where computers had already been introduced in schools. Second, Lahore and Islamabad provide better security conditions for a female researcher to survive and live by herself. Third, I had developed contacts that played an important role in terms of logistical arrangements and recruitment of research participants'.

In all I spent 11 months in the field (July-November 2003 and February –July 2004). I divided my time into three phases. The initial three months were what I term the first phase of my field research, the subsequent two months the second phase, and the remaining six months the third and final phase.

In the first phase I started by identifying the most important leads and then followed these to get new ones. I started with a friend working for 'Super Computers' (a pseudonym given by me to the company responsible for providing many of the computers that the government of Pakistan had promised to different schools all over the country in one of its pilot projects). This helped me in obtaining the names of different people involved in the project. These people in turn provided me with more names, which led to recruitment of the sample. I spent the first phase of my fieldwork making contacts with my potential research participants and explaining to them my research. I also held two focus groups in the first phase of my research. Participants in the focus groups helped

in the identification of important issues, such as extra fees for computer classes, non-availability of teaching staff, use of public school buildings for non-educational purposes, etc. I added the identified issues to my list of questions and observations.

I started by preparing a summary of the main concepts of my research design in Urdu. I must mention that I had not anticipated the difficulty of translating some concepts of critical theory and making them clear to all my research participants. For example 'critical awareness' and 'empowerment' were two concepts that my participants could not immediately connect with education or with the use of technology. However, I have to admit that in the process of translating and explaining, I ended up learning how certain concepts had different meaning for different research participants. This led to a reconfirmation of the critical theoretical framework, i.e., that "one's location in the world or position in the web of reality (which is determined by race, class, gender, sexuality, religion, etc.) shapes how one sees oneself and the world" (Kincheloe, 2004, p.3). I also translated the ethics certificate into Urdu and explained about the complete anonymity of my research participants.

In the first phase, I was also able to make appointments with some policy makers and heads of schools who I interviewed in the second phase of my research. In this phase, I also collected quite a bit of secondary data on educational issues in Pakistan from different libraries and the Ministry of Education. I also photocopied all education-related news from the archives of libraries and the government in Islamabad. In the second phase of my field research, I started the interviewing process along with visiting schools where computers had been introduced etc. I also continued photocopying news clippings and

collecting other education-related data from libraries in Lahore. I held two more focus groups during the second phase of my research.

In the third phase I continued with interviewing, participant observations and informal conversations. I also held one more focus group at the beginning of the third phase. Dividing the fieldwork into three main phases proved to be useful for me. For one thing, it not only gave me time to reflect on what I had done in each earlier phase of the fieldwork, it also permitted me to visit new situations, reconsider and revisit older ones and examine some evidence that I had previously considered irrelevant or had overlooked. Most importantly, I was also able to get feedback from the participants in the study on the preliminary results and analysis. Their input helped me in unfolding and refining the research design in second and third phase of my field research.

Contextualizing qualitative methodology

Qualitative methods have long been defined in mainstream sociology as lacking in quantitative methods or characteristics; for example, a leading dictionary of sociology defines qualitative analysis as follows:

> Qualitative Analysis...refers to analysis, which is not based on precise measurement and quantitative claims. Sociological analysis is frequently qualitative, because research aims may involve the understanding of phenomena in ways that do not require quantification, or because the phenomena do not lead themselves to precise measurement (Abercrombie et al. 1988, p. 200).

I believe such a manner of defining qualitative methods presents an apologetic version of qualitative research that leaves researchers with no sense of what it represents, aside from its non-quantitative nature. The dominant methodological discourse structured

by society, which makes quantitative research the standard for comparison with other approaches, is no longer a main concern in what Denzin and Lincoln (2000) call the 'seventh moment in the historical field of qualitative research'. Epistemological theorizing as to what constitutes qualitative and ethnographic research has changed with time. Therefore, any statement that claims to use qualitative methodology for research purposes requires clarification and a proper mapping of what qualitative methodology means to the researcher and where she situates her research context. Denzin and Lincoln (1998, 2000) locate qualitative research in terms of historical moments. These moments according to them (1998, 2000) are "...somewhat artificial; ... socially constructed, quasi-historical, and overlapping conventions. Nevertheless, they permit a 'performance' of developing ideas. They also facilitate an increasing sensitivity to and sophistication about the pitfalls and the promises of ethnography and qualitative research... (2000, p. 2)".

Briefly put, the first moment (1900-1950) was mainly characterized by concerns over validity, reliability and objectivity. The second moment (1950-1970) saw emergence of new interpretive theories like ethnomethodology, phenomenology, critical theory, and feminism, but was still marked by efforts to make qualitative research as rigorous as its quantitative counterpart. By the third moment (1970-1986), the orthodox positivist totalizing approaches had given way to pluralistic, interpretive and open-ended perspectives. The fourth moment (1986-1990) was dominated by crisis of representation, legitimation, and praxis. Fifth moment (1990-1999) saw a postmodern period of experimental ethnographic writing where new approaches, such as, reading theories as tales from the field, using epistemologies from earlier silenced groups,

action/participatory research and activist-oriented research were explored and refined in effort to make qualitative research more representational and legitimate.

My qualitative inquiry into the introduction of computers in public schools in Pakistan is located in what Denzin and Lincoln (2000) term as the sixth moment of qualitative research. The earlier controversial methods like fictional ethnographies, ethnographic poetry, and multimedia texts are now considered legitimate locations for doing research. However, what makes qualitative research significant and distinguishes the sixth moment from earlier moments is the current acceptance on the part of qualitative researchers to connect qualitative research methodology and methods with the requirements of humanism and a free democratic society.

In my research I contextualize qualitative methodology for inquiry into the 'humanistic model' from critical theory. Critical theory, especially as used by critical pedagogists, emphasizes the importance of education in creating a just and equitable society. Together, critical pedagogy and critical theorists of educational technology encourage the use of a qualitative methodology that makes use of a multiplicity of factors (culture, history, context, gender, class, etc.) and rejects any theoretical analysis based on monolithic entity. As such, qualitative methodology is best suited for the multi-layered analysis of the relationship between education and technology and various intersecting socio-political and historical factors that I explore in my research in Pakistan. From a number of qualitative methodologies I chose critical methodology for my inquiry.

Back ground and theoretical sensitivity

In qualitative research, the researcher herself forms an important aspect of its credibility. In other words, the credibility of a qualitative research report depends greatly

on the confidence readers have in the researcher's ability to be sensitive to the data and to make appropriate decisions in the field (Eisner, 1991; Patton, 1990). Researcher's skills and readiness to attempt a qualitative inquiry form an important aspect of data collection. Glaser and Strauss (1967) and Strauss and Corbin (1990) refer to the concept of 'theoretical sensitivity', which indicates a researcher's readiness and qualitative skills. According to the latter theoretical sensitivity "... indicates an awareness of the subtleties of meaning of data. ... [It] refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand, and the capability to separate the pertinent from that which isn't" (Strauss and Corbin, 1990, p. 42). In this respect the background of the researcher becomes very important in defining her theoretical sensitivity as a number of sources such as professional literature, professional experiences, and personal experiences add to this theoretical sensitivity (Strauss and Corbin, 1990).

My involvement in this inquiry is no doubt the result of me being a Ph. D. student involved in research and thesis writing. However, there are some important factors that cannot be separated from my perception of 'who I am' and my belief in 'how knowledge is constructed'. These factors play an important role in how I see the world and thus naturally had a significant influence on how I conducted my inquiry. I was born in a very privileged family in Pakistan and grew up living a very protected and sheltered life. Pakistan is a class-bound society; if one is born to the upper or upper middle-class, the chances are that you grow up living in a world that has no contact with the real world outside. You never take public transport, you go to schools where the other kids are from a similar background, you enjoy the rainy season without getting to know millions of houses have been washed away, you enjoy summers hiding in your air-conditioned

houses or you take a trip abroad. The media was pretty much state-controlled in the Zia period when I was growing up and I don't really know to what extent my parents knew about the problems Pakistan was facing, but they never mentioned any to us, (may be they thought we were too young). By the time I was sixteen I had lost both my parent, but they left us well provided for, and apart from the great tragedy of loosing not just our parents but our best friends due to an 'act/ will of God' life was still great. I got married a year and a half latter. My marriage was arranged (not forced) by my aunts. The idea was that I get married to someone from my own social class.

My husband shares the same family tree from his mother's side; his family enjoys their ancestral lands right next to our ancestral lands. A perfect match for both of us, though little did both families know that my husband's interest in academics and his quest for knowledge were to form such an influence on my personality that in years ahead both of us were to be labeled 'rebels', 'non-conformist' and perhaps 'disobedient' for questioning the given. I continued my education after I got married. My husband had just finished his M. Phil and was drawn into teaching at the prestigious Quaid-i-Azam University in Islamabad. His parents had thought his infatuation with teaching would be a passing affair and that once married, pressures of actual life would take him to the right path i.e., the sought after 'Civil Services of Pakistan'. With his brilliant academic record there was no doubt in anyone's mind that he could become a high level civil servant, which is a most coveted position in South Asian countries. After my marriage I moved from Lahore to Islamabad where my husband and I lived by ourselves.

My husband had a lot more exposure and insights than I into actual Pakistani life. For example, it surprised me to see him keeping our marriage certificate in his wallet as it

was a common practice for the police to harass young couples. This shows how unfamiliar I was with the actual realities that young Pakistani men had to face when going out with a female; no wonder we were stopped by police and timely production of certificate saved us from a lot of hassle. Similarly, a lot of things that I said amused my husband, as they had no contact with reality, so he took it upon himself to show me the actual life that the majority of Pakistanis lived.

My first public transport trip was on a local bus from Islamabad to Rawalpindi; we ate at local *'dhabas'* (shanty hotels). It was a different world, difficult but beautiful, and it was also a challenging world, which had enormous potential, but something was stopping that potential from being realized. What was this something? As I continued my education I decided to go for a master's degree in anthropology. I wanted to study cultures. More importantly I wanted to study *my* culture; I wanted to know why people behaved in a manner that actually militated against their well being, or was it that 'well being' needed to be redefined? After completing my degree I worked on a number of development projects with national and international donor agencies. By this time our families were thoroughly disappointed with us. My husband had not taken the predicted path; I had failed as a wife in not prompting him to do so: our lives were definitely below the 'expected standards' and we mingled with 'all sorts' of people. On top of that my decision to continue my education and my husband's support clearly demonstrated our lack of interest in continuing the family's lineage by not having produced a child.

My experience with working in Pakistan's remote areas and my interaction with the 'common' people were instrumental in breaking a lot of stereotypes. I could see more commonalities than differences. I found the behavior that anthropologists saw as

'irrational' made perfect sense seen from their point of view. But how were we to make sense of their behavior unless we gave them a chance to talk, to express their views. I found most of the time 'experts were talking 'at' people, not talking 'with' them, engaging in a one-way dialogue, which led in turn to a one way interpretation of each others behavior. I saw project after project fail because the so-called experts were convinced that they were dealing with 'people who did not understand what was good for them'. I saw sincere and well-intended projects fall because not enough attention was paid to collaboration, facilitation and critical reflection on both sides. How could such failures be avoided? I asked myself. I thought we could start reconstructing by deconstructing. We could start by deconstructing the established norms, power relations, experts' role and most importantly by questioning what constitutes as knowledge and who produced it. Only then can we start by reconstructing ideas based on the collective nature of knowing. We could do so by using dialogue, by giving the 'other' a chance to speak, by bringing in their voices to explain their experiences. Collaboration, dialogue and critical reflection could prove to be very precious tools for bringing about an equitable change.

My experience at McGill University as a graduate student since 2001 has also played a part in defining my theoretical sensitivity. Taking courses in critical theory and ethnography and being exposed to a whole new world of meaning-making definitely influenced my world view. These experiences have had an impact on how I see and understand the world; on how I attach meanings to different things in life. These experiences form an integral part of who I am and how I interpret what is said to me.

They are thus a part of my theoretical sensitivity as well as a part of my emotional baggage.

Critical methodology and insights from critical theoretical framework

There are a number of strands of research that can be identified with critical methodology. What brings them together under the rubric of critical methodology is their shared assumptions, especially with respect to the aims of research, the role of the researcher and her subjectivity, to name a few.

Let me briefly explain what I mean by methodology. Methodology involves a conceptual framework based on a theory that generates discussion as to what accounts are reliable and valid knowledge: it defines the principles researchers adopt when considering which methods to use in their study of the social world. Critical methodology can be seen as a contextual and evolving theory of inquiry within a research program. It includes both a network of background assumptions and the adoption and application of research strategies that present better possibilities for researchers' understanding of the subject matter. However, some amount of theoretical coherence within the research program is prerequisite for the use of critical methodology. As Yancher and Gantl (2005) note:

> From this basic methodological position, it follows that the processes of method selection and method use are inextricably theoretical: investigators begin with a theoretical and historical sense of the subject matter and questions worth studying, the appropriate strategies for investigating those questions, and the most effective ways of handling problems that arise in the course of research (Yancher and Gantt, 2005 on-line).

In critical methodology, methods are seen as theories of inquiries rather than fact-producing tools. This means that the emphasis is not on method *per se* but rather on contextually sensitive research strategy. To achieve contextual sensitivity or to accommodate the practical demands of research, questions and strategies are continuously examined and often changed by the researchers. However, this does not mean that methods are not important or that "all rules and standards are worthless and should be given up' (Feyerabend, 1993, p. 231). The reason critical methodology allows such innovation and creativity is because of the acknowledgement that techniques and conventions are limited and that at times, due to subtleties and specific contextual requirements, they need to be altered. Another reason is because judgments such as 'truth', 'deeper', 'better', etc., are themselves tentative, contextual, and value-laden; therefore, critical methodology insists on continued reflective process on the choice and improvement of methods used for data collection and analysis.

Let me now turn to how the use of critical methodology informs my inquiry and my choice of methods and strategies for data collection. As stated earlier, my constructionist epistemological stance (see chapter 3) prompts me to search for new methods and embrace qualitative research as a means to explain and describe reality as constructed socially. Such epistemological understanding also ties in with critical methodology, which emphasizes that concepts should be seen as assumptions based on value-laden, ever changing and historically contingent arguments. Use of critical theory–especially critical pedagogy and critical theory of educational technology together as a theoretical framework–affords me the coherence that is required to make use of critical methodology.

A critical theoretical framework provides me with a network of background assumptions and helps me problematize educational technology-related issues in Pakistan. For example, the dominant rhetoric used by the Pakistani government for introducing computers in public schools is that such an introduction will result in better standards of education and better employment opportunities for all Pakistani citizens. Insights from critical pedagogy prompt me to situate schooling in the socio-historical and cultural context of Pakistani society in order to raise questions and address issues related to the relevance of policy to the ethos and needs of the society. Critical pedagogy also prompts me to look for and investigate power relations within educational institutions and in the society at large and to explore how power relations affect teaching and learning. At the same time the critical theory of educational technology prompts me to look into the issues of software and hardware availability, teacher training, integrated curriculum, etc.

My constructionist epistemology, along with critical pedagogy and critical theory of technology, warn against simple cause and effect evaluations and analysis. They direct the focus of my inquiry and choice of methods by stressing the fact that what is described as 'educational technology', 'better standards' or 'good education' is constructed within the socio-cultural and historical context of Pakistani society. Therefore, to achieve any understanding of educational technology or the role of computers in education or how computers may or may not contribute towards 'better education' and human development requires me to use a mix of concepts, schemes, tools or strategies to see how different research participants make meaning of the introduction of computers and define 'better education' or the role of computers' in schools.

However, it is important to note that critical theory in itself is not attached to any particular methodology. The aim of critical theory is to explicate interpretations and comparative generalizations. The distinctiveness of critical theory lies in the use of various techniques within a particular 'system of inquiry'. As Laudan (1997) explains, critical researchers' choice of methodology is guided by critical theory's main concern, i.e., that "rationality and progressiveness of a theory are most closely linked—not with its confirmation and falsification—but rather with its problem solving effectiveness" (p.5). In the case of my inquiry, critical pedagogy and critical theory of technology provide the theoretical base to utilize critical methodology and multiple methods, techniques and tools of analysis in the Pakistani context.

Methods

Both critical methodology and critical theoretical framework allow me a wide range of methods to choose from. As Harvey (1990) notes:

> Critical social research is clearly not constrained by its data collection techniques...empirical studies...include the whole gamut of research tools: observations, both participant and non-participant; formal interviews with random samples; semi-structured, unstructured and in-depth interviewing; key informants testimonies, analysis of personal and institutional documents; mass media analysis; archive searching; examination of official statistics; and reviews of published literature. Furthermore, critical social research also uses a wide variety of analytic techniques: ethnographic interpretation, historical reconstruction, action research, multivariate analysis, structuralist deconstruction and semiological analysis (p. 196).

My preference to choose certain methods out of many possible alternatives is guided by both my epistemological and theoretical orientation and from my previous research experience in Pakistan[24]. As Polkinghorne (1983) notes:

> methods ... take their validity and reliability from their participation in a particular system of inquiry...particular methods do not operate independently of a system of inquiry; the use of a method changes only as a researcher uses it in different systems of inquiry...the meaning of a particular research conduct is determined by the context of its system of going after 'knowledge' (p. 6).

Focus Groups

As a critical researcher, my methodology aims at a continuous process of reflection. In this respect I draw upon the concept of 'catalytic validity' suggested by Patti Lather (1991, 1993), as it provides a good opportunity for reflection. "Catalytic validity" not only encourages the researcher to reflect but it also helps research participants understand the world around them and achieve self-direction to bring about a change and transform the world. In an effort to develop what Lather (1993) has described as 'catalytic validity' I held focus groups. As Goss & Leinbach (1996) articulate, focus groups provide participants an opportunity to gain access to new information, new ways of thinking, in the sense that they have the right to speak and the authority to act; in short, a sense of emancipation. Holding focus groups helped me to explore how my research participants defined the role of technology in education and how their consciousness about the role of education and educational technology was influenced by dominant discourses, political statements, media announcements, newspapers, etc. In other words I wanted to find out how ideology played a role in the way my research participants linked technology with

[24] I have worked as an anthropologist on a number of projects and taught in Pakistan.

education, and defined the role of education. Holding focus groups also provided me with the opportunity to start a dialogue by asking questions that led to a better understanding of the different power dimensions at play in the educational system and in the process of introducing technology into public schools.

Focus groups proved to be very helpful for my research project, especially in the exploratory stage, by generating ideas and identifying the appropriate range of issues related to the introduction of technology into classrooms. Foundational critics might see this as being subjective or having bias. In fact, it can be alleged that I see my role as elitist. However, I share Marc Manganaro's (1990) conviction that,

> No anthropology is a-political, removed from ideology and hence from the capacity to be affected by or, as crucially, to effect social formations. The question ought not to be if an anthropological text is political, but rather, what kind of sociopolitical affiliations are tied to particular anthropological texts (p 35).

An important aspect of my research was to raise consciousness about issues related to the introduction of technology; focus groups helped me by having group discussions and providing me with awareness of key issues. As such, they were also instrumental in a critique of aspects of technical educational policy that helped research participants to collectively change their consciousness by fostering a sense of collective cause and common issues to think about. Focus groups were also helpful in identifying research participants, resource persons and sources of data. As a critical researcher, my hope was that the dialogue started in the focus groups would be taken further as a dialogue between those involved in education and members of the community at large.

My initial plan was to conduct two focus groups of 8-12 research participants from similar backgrounds. For example, the focus group with teachers was to include teachers only and not parents. The idea was to gain information from and reflect upon through interactive group discussion through the specific perspective of particular research participants who formed the focus group. However, I ended up conducting five focus groups with 4-6 research participants in each group. After a couple of failed attempts to hold focus groups, I quickly found out that use of the term 'focus group' tended to scare people as it made the whole exercise seem more official. I started inviting people to a 'discussion' or to 'talk about their views' and this seemed to work better. I also stressed the value of the study, the importance of their opinions and took time to explain to my participants how I would use the information provided by them. This made them comfortable and put them at ease.

I held focus groups to see how different group participants attached meanings to the use of technology in education, how they defined technology, and how they defined education. In the focus group with parents I was especially interested to find out how they viewed the instructional use of computers, how they defined technology and its relevance for their children. I wanted to find out about parents' understanding of how their children were being affected by the introduction of technology and larger educational reform. In this respect, the main purpose behind holding focus groups was to identify the issues most relevant to different sets of research participants.

I started the focus groups by describing the purpose of my enquiry and by telling the participants how their views would help me gain insight into and guide my research in the right direction. Focus groups proved very helpful in reflection on current educational

practices, and developing further questions. For example, the issue of a tuition being charged beyond the government's prescribed amount for computer classes by afternoon schools came up during my focus group discussion with the parents. This was an issue that I had not anticipated. It led me to more interviews with district authorities and school principals. This is just one of many examples of how focus groups directed my research process.

The questions I asked during focus groups were open ended and encouraged description and depth. I tried using simple, clear language that participants could understand. I generally started with 'how' questions and than later in the discussion raised the 'why' questions. For example, I started by asking the teachers 'how do you feel about the addition of computer labs in your school?' Or 'what is your opinion about the computer curriculum?' Do you think computers are helping students learn better? Only later did I ask the 'why' questions. For example, I asked 'Why do you think public schools need computers?' Similarly, in focus groups with parents, I started with simple opinion questions and then went on to ask questions that needed more reflection and details. For example, I would start with simple demographic questions such as how many children someone had and then go on to ask questions like, 'what are some factors that motivated you to enroll your child in computer course or the afternoon schools?'

As I mentioned earlier, I conducted five sessions in all. After each session I used to ask my participants whether they understood the questions. How, I asked, could I make my questions clearer? I also asked them if I had left out any important topic or aspect, and their suggestions proved very helpful in further discussions and picking samples for interviews.

Interviews

I also collected data through conducting in-depth interviews. This choice was guided primarily by the assumptions of constructionist epistemology and critical framework that knowledge is socially constructed. Following Bertaux (1981), I believe that, "given a chance to talk freely, people appear to know a lot about what is going on" (p.39). In-depth interviewing provided me with an opportunity for a one-on-one direct conversation with my research participants. To achieve honest responses I started by explaining the purpose of the interview. I also ensured my respondents of confidentiality and anonymity before arranging the interview with them. I began by preparing a questions guideline for myself and organized the topics and issues I wanted to cover in advance. I grouped together similar topics and questions, which helped me to maintain the flow during the interview process. However, I was always prepared to alter the order of the questions to fit the conversation.

A major concern of my research was to understand the experiences and meanings that people as stakeholders attach to the role of education and the introduction of computers into classrooms. In-depth interviewing allowed my research participants to express their thoughts and use their own concepts in their own language. The interview method proved particularly valuable for gaining insights into how different respondents defined educational and technology related issues and problems. Their stories reflected their worldviews about technology, its role in education, role of teachers, curricula and other issues and problems related to public education. In-depth interviews allowed me to listen to a wide variety of voices and different perspectives of my research participants on issues related to public education and technology.

From a critical theoretical framework interviews are not just 'talk'. These are conversations that constitute social interaction and that reflect the social relations and meaning-making practices of the respondents. Therefore, the words uttered by respondents could not be treated as a transparent medium that depict 'reality'. I, therefore, treated interviews as stories by which research participants described their worlds and the meanings and importance they attached to technology and its presence in schools. For example, when one interviewee told me that technology was very important in her life, I asked him how often he uses technology in everyday life? Does he use ATM machine at the bank? Does he own a computer at home? Such further probing revealed the cultural meanings or the influence of dominant discourse about technology that is usually reflected in the initial response of the interviewee.

As in many other developing countries, computers in Pakistan are more or less a status symbol and many people like to associate themselves with computers even when they might not own or have access to them. Thus, probing questions usually helped the respondent to reflect on the actual importance of computers in their lives. In the above interview the same respondent told me that the bank manager had refused to issue an ATM card to him, as his pay did not meet the criteria, nor did he own a computer and had actually never used a computer. On reflection he concluded, "I think that computers don't really play any important role in my life". This example shows how interviews can be treated as narratives of cultural and historical experience and how respondents respond with culture-specific elements.

Through in-depth interviewing I was able to explore various issues that were important for my understanding of respondents' understanding of issues. For example,

through in-depth interviewing I could listen, ask for clarifications about issues that I did not understand, probe the issues they thought were important regarding educational technology, ask participants to tell me their stories, and encourage them to tell of their own personal experiences with technology. According to Seidman (1993), "in-depth interviewing is understanding the experience of other people and the meaning they, make of that experience" (p. 3).

Conducting interviews demands a certain amount of cultural knowledge and indeed my previous experience in Pakistan helped me, by polishing my interpersonal skills, to draw out information. For example, I was aware of the fact that, due to persistent educational failure, mismanagement, corruption and low self-esteem associated with the education department/ministry even at highest official level, any inquiry about education or educational practices is a very touchy issue in Pakistan. I was also conscious that, unless a good rapport was built, any questions pertaining to 'why' or 'touchy' issues could put research participants on the defensive, leading them to justify their actions or opinions and side-tracking the main topic under discussion. I was certainly careful not to ask 'touchy' questions at the beginning of the interview. These were left for a later stage. Once the rapport was well established, as mentioned earlier I stared the interviewing process by describing my inquiry and by asking a few demographic or descriptive questions that were easy to be answered and also helped in breaking the ice. I usually began by telling my respondent that her name came highly recommended to me and her views will add important insights to my inquiry. I found that while this method put the respondents immediately at ease and gave them an opportunity to talk about what they had done to improve the system; it also gave me insights into their attitudes and

behaviors. Moreover, it afforded me time to judge and decide at what stage I should bring in the more sensitive questions.

Furthermore, I drew insights from Gubrium (1993) and Voysey (1975), who argue that interviews open up for analysis the culturally rich methods through which interviewers and interviewees, in narration, produce possible accounts of the world. However, along with paying close attention to my respondent's verbal accounts, I also paid attention to non-verbal behavior, especially looking for signs when the interviewee felt uncomfortable. Such non-verbal behavior gave me important clues about the interviewee's level of comfort with the topic under discussion. For example, when principals from Community Participation Project (CPP) were asked about the extra fees being charged on top of the government-prescribed rates, both principals showed clear signs of frustration. I made a mental note to develop additional questions about this issue and ask them at an appropriate time. Observing such non-verbal gestures during the interviewing process provided me with important clues to pursue more information, to offer reassurance, and at times to change topics. Many interviews were completed in more than three sessions. I tape-recorded interviews with the permission of the interviewees. In a couple of cases, interviewees were not comfortable with tape recording, so I took notes.

I maintained a field journal throughout the period of my field research and logged the date, time, and place of the interview along with my thoughts regarding how the interview went, my feelings and impressions of the interviewee. Keeping such a record helped me in the process of reflection, in pinpointing any inconsistencies in interviewees' replies and in remembering nonverbal details.

If a respondent's answer was not very clear I asked for details, showing my respondents that I wanted to share experiences with them. In this way, probing not only helped me to elicit extended responses and greater depth regarding various issues but also helped in building a rapport with the interviewees. I established a rapport with the subjects to a point where interviewing became a relationship in which I could win the trust of my research participants. As a result, participants were able to trust me with information while at the same I tried maintaining a healthy distance, so that my voice did not appropriate theirs. I tried to summarize important points towards the end of each session to make sure that I had made correct interpretations of the interviewee's accounts. I also tried transcribing most of my interviews during the fieldwork period.

Participant observation

As a critical ethnographer, my goal was to use participant observation to find different ways in which the dominant discourse regarding technology and education, one that involved claims to equality and justice for all, was actually playing out within educational institutions and settings. These claims to equality and justice played a central role in the rhetoric being used to introduce computers into public schools in Pakistan. As a critical researcher, I saw the culture of schooling as a system of social processes and practices grounded in social relations affected by politics, economics, history, etc. My epistemological stance and theoretical framework directed my attention to the fact that reality is socially constructed; thus, within any given community there are bound to be multiple perspectives. As a critical researcher I was interested not only in knowing about the diverse perspectives held by different groups regarding education and the use of

educational technology, but also in understanding the interplay among such diverse perspectives.

Thus, I searched for multiple reasons, logics, acts, actions, and voices with regard to the role of education and the place of technology in schools. I participated in the activities of the four schools where technology was being or had been introduced (two in Lahore and the other two near Islamabad) during my research. I developed a good rapport with members of these schools and spent 3-5 hours each week in each of the schools where I observed the technology-related educational activities of grades eight to ten.

Participant observation provided me with an important method to cross check what research participants reported during interviews and focus group meetings. This should not be taken to imply that I did not trust my research participants. I believe I received truthful answers, but I was aware of the possibility that I might not know all the right questions to ask or might ignore an important issue. For example, in one of my informal conversations with one of the 'chowkidars' (guard/gate keepers) I learnt about the hostility and ill-feeling between the morning and afternoon school administrations. This led not only to the recruiting of a morning principal into my interview sample but also provided important insights for my inquiry. This information raised issues of power struggle and lack of consensus about the usefulness of the CPP project that I was studying.

Thus, participant observation helped me not only to understand data collected through in-depth interviews and focus groups, but also helped me to identify important issues and design questions for better understanding of the problems associated with the introduction of computers into public schools. Participant observation proved a very

useful method for gaining better understanding of the physical, social, cultural, and economic contexts of the public schools in Pakistan. It gave me an opportunity to learn more about the public school environment, and a better opportunity to relate with the 'insiders' while remaining, inevitably, an 'outsider'.

It also helped me actually to experience how computer classes were conducted and to try my hand on some of the computers installed in the new computer labs. I was able to study my research participants in the public schools themselves and thereby observe the relationships among and between teachers, students and administrators. I was able to see how teaching and learning was taking place or not taking place. Participant observation provided me with an opportunity for frequent informal conversations, which enhanced my insights into the different perspectives held by school administrators, teachers, students and parents. It provided me with an opportunity to experience the cultural milieu of public schools in Pakistan, which in turn proved invaluable to my understanding and contextualizing of the problems related with public education.

Participant observation also proved very helpful in facilitating and developing positive relationships with my research participants. I met my key informant through someone while I was at one of the schools for observational purpose. My key informant proved invaluable in helping me not only to identify the potential research participants but also in gaining access and permission to interview many high officials in Department and Ministry of Education.

Adler and Adler (1994) term observation as, "the fundamental base of all research methods" (p.389). I went with broad questions in mind before beginning participant observation. These questions were related to my research objectives. I also created a

checklist to help me remember what I wanted to observe. There were specific aspects of behavior that I was looking to observe for specific categories. For example, for my category 'technology' I wanted to see what kinds of hardware and software were available in the schools? Did they mach the descriptions in the project details provided by government? How often did students use computer during a computer class? Did other school children have access to a computer lab? Were computers connected to the Internet? How often did the teacher or students use the Internet? etc.

In terms of 'power relations/ hierarchy' I was interested in observing factors such as gender, physical appearance, who spoke to whom, for how long and in what manner. What were the languages being used? What was the tone of voice? What were people doing? What were the different dynamics of interaction between different actors? And other factors like profession, social status, socioeconomic class.

Similarly, to find out about 'teaching methods' I was looking for the interaction between teacher and students. How was the teacher teaching? Lecturing? Were students allowed to ask questions? How did students and teachers use their bodies and voices to communicate different emotions? How did they show their feelings toward one another, through verbal abuse or use of space? How did students enter and exit the computer lab? How long they stay in the computer lab?

As with the interviews my observation data also consisted of detailed field notes that I used to record in a field journal during my free time every day. My field notes included accounts of details of events, notes about how people behaved and reacted, how people interacted with each other, what was said in conversation, etc.? I also recorded my responses, surprises and feelings as reminders to trigger my memory when I was

expanding my field notes. I likewise recorded informal conversations and interactions with other members of school staff such as the 'chowkidar' (gate keeper), 'canteen owner' and non-teaching staff members and these provided me with important clues about power issues.

Participant observation helped in partly confirming my ideas about public schooling in Pakistan but more importantly it helped me to discover issues I had not anticipated.

Documents

I chose document analysis as one of the methods to collect data in order to trace the history of educational policy-making and planning and to review current educational and technology-related policies, initiative and plans. I believe that the complexity of Pakistan's educational problems, which are interlinked with other socio-cultural, political and historical factors, cannot be examined without historicizing the educational policy-making and planning in Pakistan. Educational policy making and planning does not take place in isolation and are largely dependent on national and international political climate. For example it appears that the explanation of the successive failures of different educational programs over the last fifty-nine years in term of lack of resources only offers a partial explanation of the problem. However I believe that it can be seen differently by taking into consideration the political and economic history of Pakistan. Thus, I analyzed various policy documents, educational reports educational projects, etc. While I am aware that many of these documents were written or produced by the Government of Pakistan putting them in a historical and political context offers a number of useful insights into who wrote these documents? What were the political conditions? How did these documents create a discourse, etc?

Analysis of documents is sometimes wrongly considered as a cost effective and time saving method. In reality, this method of data collection is complex. For instance, meanings of text are not inside the text but in the writing and reading of it. This means as the context changes the meanings of text will also change. This also means that the documents have to be read in conjunction with a large number of related texts. For example, my reading in the present time of various educational policies and directives issued in the Zia period shows that the educational policy not only aimed at educational reform but also at indoctrination and the political survival of the regime. Therefore, the interpretation of documents and records is not simple and straightforward. According to Hodder (2000), "text and context are in a continual state of tension, each defining and redefining the other, saying and doing things differently through time" (p.704).

Interpretation of various records and policy documents forms an important aspect of my research. This is because of my epistemological conviction that there are multiple realities made up of multiple and conflicting voices that may not be expressed in conversations alone. Thus, it was important for me to analyze these written texts. An analysis of previous educational policies and reports written about the status of education was also important to properly locate and situate the debate about the introduction of computers into Pakistani public school classrooms.

I analyzed a large number of policy documents related to educational policy. These include various five-year plans and reports related to educational policy from 1947 to the present. Additionally, I also examined various educational-technology related documents issued by the Ministry of Science and Technology (MOST). Document analysis provided me with an opportunity to gain insight and examine trends and patterns in educational

policy-making practices in Pakistan. A critical analysis of policy documents also highlighted the inconsistencies between rhetorical planning, budget allocation and actual implementation of various educational initiatives. For example, an analysis of the first three five-year plans shows that, despite the rhetoric of fighting illiteracy and promoting universal primary education, no funds were allocated to promote literacy; rather, more funds were instead allocated to secondary and post-secondary education. I discuss the details of such inconsistencies in chapter five.

However, there were many difficulties and limitations that I had to face when choosing the method of document analysis. Some of these problems were a result of the specific Pakistani context. To give an example of the problems I faced in document collection, I found that access to all government documents was almost impossible. Pakistan does not have a central library to archive government documents. Most educational documents are spread over different departments in different locations. Many documents are 'for eyes-only', i.e., not for public use. In many cases even public documents are not made available to researchers. In many cases, after pulling all possible strings (i.e., using my contacts to gain access to documents) I found that many older documents or materials were unreadable, incomplete or missing. I tried to fill the gap by consulting other secondary sources.

I also consulted various journals related to education in Pakistan. '*Taleemi Zawiyay*' (trans: Educational Perspectives) is the only journal of education in Pakistan that has a consistent publication record (unfortunately, Pakistani educational journals have not been able to sustain themselves and often disappear after a few publications or have erratic publication record). I collected data from the two leading Pakistani newspapers (one

English and one Urdu) for the period 1995-2002. I scanned through them for editorials, op-ed pieces on issues related to education and technology and information on the discourse of educational technology as it has played out in the national media.

I analyzed the documents with specific questions in mind, such as: Who wrote the documents (text)? For whom were they written, i.e., who was the target audience? Under what conditions and circumstances (socio-political) were the documents prepared? What do these documents say and what do they leave out? etc. Such systematic examination helped me to learn about the difference in the meaning-making practices of different actors involved in the process of education. The journal '*Taleemi Zawiyay*' proved to be an excellent source for gaining insights into the world of public teachers and the insecurities and low self-esteem attached with teaching as a profession in Pakistan. For example, an article "*Punjab main school management commeettion ka kiam*" (trans; the creation of school management committees in Punjab) (Chaudary, October 1999) describes in detail the feeling of hostility on the part of teachers at being excluded by the government from the decision-making process to form 'management committees'. "According to 1994 directive the head of school was supposed to be the chairperson of such committees but in 1999 government issued a new directive where the head of the school was to act as the sectary and a parent would be the chairperson. Teacher' s Association felt whatever little integrity they had was being taken away from them and they filed a writ in the High Court... what was a positive step towards educational reform became a point of dispute because teachers were not consulted" (Chaudary, 1999, p. 44-46).

In addition to gaining important insights into social relations and interactions among the various actors involved in education, a detailed reading of documents also helped me to formulate a preliminary set of questions regarding the educational system and various problems to pose to focus groups, interviewees and my own observation checklists.

Methodological Issues

In the following section I discuss my position in the research process especially my take on issues of voice and signature, the relationship between knower and knowledge and, my role as insider and outsider. It is important to explicate my position on such important issues as these connect my ontology, epistemology, methodology and theoretical framework. My stance on methodological issues is also connected with my life experiences. However, before reflecting on my position in the research process, let me acknowledge that providing such an account is itself problematic on a number of headings. First, it has been argued by some that there is a potential for silencing the participants/subjects by overwhelming the text with reflections on the researcher's subjectivities (Lal 1996). Similarly, Okely (1992, p. 5) argues that the mere addition of autobiographical or personal information can serve to establish and assert the researcher's authority, which can ultimately produce texts from which the self of the researcher has been washed away.

Second, Billig (1994, p. 326) raises the question: How do we write the self into the text? Third, there are also concerns about the situatedness of the researcher. Scholars such as Clough (1992) and Rosaldo (1989) argue that the reflexive mode of the comparatively privileged researcher in the study of marginalization has the possibility of silencing the subjects. As Rosaldo puts it, "if classic ethnography's voice was the

slippage from the ideal of detachment to actual indifference, that of present-day reflexivity is the tendency for the self-absorbed self to lose sight altogether of the culturally different 'other'" (1989, p. 7).

Critical race theorists such as Ladner (1971), Lawrence (1995), Matsuda (1995) and Haraway (1991) have stressed the political nature of the reflexive mode. They argue that the reflexive mode is a political act because vision is always a question of the power to see: therefore, those who are afforded or those who appropriate the power to see and speak and represent others, can reflect their own political views. Thus, different theorists view reflexivity differently. While some view it as 'a response to the realization that researchers and their methods are entangled with the politics of the social world they study', others view it as too 'self-critical', 'dead-end indulgence, narcissism, and solipsism' and commitment to objectivity, 'politics of location; etc. (Marcus, 1994; Holstein and Gubrium, 1994; Hammersley and Atkinson, 1995; Gubrium and Holstein, 1997; and Smyth and Shacklock, 1998).

While I am aware of the problems associated with adopting a reflexive mode, I believe that for a very long time social researchers have concealed their subjective views behind the veil of neutrality, thereby placing the total load of representation on the shoulders of informants. This practice in my view should no longer be acceptable. I tend to agree more with Ruth Behar (1993), according to whom, "we ask for revelations from others, but we reveal little or nothing of our selves; we make others vulnerable, but we ourselves remain invulnerable" (p. 273)

I used a reflexive mode as a tool in the process of my research, since it provided me with an opportunity not only to rethink and refine my methods and questions but also to

come to terms with and focus on the complexities of my presence within field research in a methodical and authentic manner. It helped make me more sensitive to the nature of the setting and more understanding of my own effects on the process of research through interacting and perhaps bringing about a change in the culture that I was investigating. I consciously used the reflexive mode and stated my subjectivity wherever possible.

Insider or outsider

One important concern of qualitative researchers has been whether ethnography and interviewing generate richer and more valid findings if carried out by an 'insider', i.e., a researcher who belongs to the same social or cultural group as the people being studied, or by an 'outsider'? Such concerns raise questions about my position in the research process i.e. am I an outsider or am I an insider with respect to the research context and the process?

I see myself as both an insider and an outsider in Pakistan's context. I believe that a rigid distinction between 'insider' and outsider is not possible. In my case my power position (social class, education, etc.) makes me an outsider to the majority of the Pakistani population. At the same time, having grown up in Pakistan and given my familiarity with the culture, customs, geography, system of schooling, and my ability to communicate in all languages (except Pushto) spoken in Pakistan makes me an insider. I believe that Acker (2000) articulates this situation very well when she asks: "When is [being an insider or an outsider] a key to insightful analysis? When does it stand in the way of clear thinking? How do we even know when we are inside or outside or somewhere in between?" (Acker, 2000, p. 190)

Miles & Crush (1993) have also argued that the personal relations of the interviewee-interviewer dynamic are not reducible to the insider/outsider dimension. Dyck (1997) further supports this argument and points out that researchers are increasingly discovering that their identities and statuses can be fluid, even within a single research project. Within the same interview, the degree of empathetic connection between researcher and researched can vary depending on the topic being discussed at the moment.

During several phases of this inquiry, I felt some people regarded me as an outsider, yet at the same time there were moments when I felt that my research participants were regarding me as an insider. Did tension arise because of the duality of roles? Did it make me nervous? The answer is no. I play multiple roles as a person; I am a student, a teacher, a wife, a friend, a Canadian, a Pakistani, etc. I do understand that my identity as a researcher is also multidimensional. I tried to use the various advantages afforded to me by my social class, family connections, education and those afforded to me my profession and gender–depending on the situation and circumstances–to play the role of an insider or outsider. For example, I used my family connections to gain access to some officials who otherwise might not have been interested in giving their precious time to a graduate student. At the same time, in an effort to recruit teachers I emphasized my identity as a teacher. I have to admit that my role as an insider or outsider was not an independent variable that I could control. Rather, my role mainly depended on a number of factors such as who I was interviewing, and what topic was being discussed. My aim as a researcher was to make use of my multiple roles/positions in order to gain access to the participants and information and build a rapport.

I understood very well that, during field research, the idea of an insider taken up uncritically could lead to an assumption that all participants in a particular social category share common experiences and perspectives. Therefore, I made use of my hybrid insider-outsider status by showing to my research participants that, as an insider, I partially shared the understanding of the topic while at the same time my outsider hybridity made me unthreatening and allowed me to present myself as genuinely wanting to learn about what they had to say. For example, my hybridity really helped me develop a good rapport with teachers and they felt comfortable talking about problems they faced with another teacher.

Relationship between knower and knowledge

As mentioned earlier, my epistemological stance is that knowledge is constructed socially. Thus, it's not only the research participants and their particular histories that condition knowledge construction. My own personality, biography, class, occupation, gender, ethnicity, political orientation and location in time and space also affect the construction of knowledge. Therefore, it becomes important for me to reflect and access how various complex circumstances affect the knowledge that was jointly constructed by the research participants and me.

Critical research aims at generating critical awareness. One of the aims of my research was to generate critical awareness and get people involved in education, in critically thinking about how technology could be made useful in the socio-cultural and educational context of a developing society like Pakistan. One of the ways in which I was able to do so was by starting a dialogue with my research participants about the state of education and the use of technology in classrooms. The idea was to create a dialogue that

was inclusive at all levels and involved views projected not only by bureaucrats and policy or decision makers but also by teachers students and parents, so that I could bring in the voices from the margins of the system of education. To do so, I started my research by holding five focus groups: two for teachers and three for parents. This gave my respondents an opportunity right from the beginning to provide nuances, reinterpretations and challenges to the concepts that shaped my research. Discussions during the focus groups brought out the voices of the research participants and helped me to construct a narrative that was the result of combined ownership of my research participants and myself as a researcher.

Focus groups also provided me with the opportunity to start such a dialogue with parents and teachers and get them engaged and involved in my inquiry. Such an involvement constitutes a very important aspect of my research due to my belief that knowledge can only be advanced through a process of exploration that puts at centre stage the experiences of the people whose voices have always been ignored. To do so I included multiple voices by working collectively with a wide range of research participants. My research participants included a diverse sample of federal, local, and district level officials, heads of schools, teachers, parents and other administrative school staff. Multiple voicing is especially promising in its capacity to recognize the problems of validity while simultaneously providing a potentially rich array of interpretations or perspectives (Hertz, 1997).

Issues of power, voice and signature

As a researcher, I was aware that I was as much a part of the research process as other research participants and that my philosophical orientation was going to influence my

construction of reality. In contrast to the positivist tradition, which argues that a researcher can stand apart from the process, my epistemological stance tells me that the knower (researcher) cannot stand apart from what she is examining. Such an epistemological stance leads to the question of my position and voice in the research and how I used it. Was I going to be the 'powerful' ethnographer who would give voice to the marginalized or was I marginalized myself, and therefore a stakeholder in the process of research?

As my biographical account presented above indicates, I hold multiple positions, dominant and dominated, powerful and marginalized, at the same time and in the same society. When it came to my position as a researcher, I was aware that in a very hierarchal society like Pakistan my behavior, disposition and manner of speaking can act as constraints in collaborative research. I showed my commitment by including the voices of my research participants and by treating my respondents as experts with professional knowledge. I tried to acknowledge the pluralities and diversities of my research participants' backgrounds by showing my willingness to explore together with them the limitations and possibilities of our inquiry.

As a researcher I questioned and rethought my own values and practices. My aim was to deepen my understanding of the different perspectives on education and educational technology provided to me by this diverse group of research participants. I have to acknowledge that this meant taking up the challenge of breaking from traditional roles and relationships, for example, when holding informal conversations with the school '*chowkidar*' (guard) I usually had lunch with him.

Usually researchers go into the field with an opinion that they will generate knowledge. I kept reminding myself that it was the participants who were generating knowledge by attaching meanings to their experiences and that I was interpreting their interpretations. Therefore, in the process of research I was not the lone researcher, nor was the knowledge produced the result of my efforts only; it is a product of the participants and others who made valuable contributions.

Issues of credibility/validity and reliability

Unlike foundational research where research is only considered valid if it is repeatable and generalizable validity in qualitative research is concerned more with description and explanation, i.e., whether or not the explanation fits the description. Wolcott (1995) discusses the absurdity of the traditional notion of validity by developing a case for no single 'correct' interpretation. I reject the traditional notions of generalizibility. These notions fall short especially in the field of education and human sciences because the main concern of researchers in these areas is with individuals and the meanings in their lives.

One thing that qualitative research does not aim at is verification of an existing theory. As a qualitative researcher I believe in multiple perspectives, multiple 'realities'. I believe that there is not one truth and I also recognize that 'bias' exists in interpretation of data. Rather, the main concern of my research is with the usefulness of the data generated. For example, did the data my inquiry produced help in explaining the situation of education and the current use of educational technology in Pakistan? In this way, my concerns are with credibility and trustworthiness rather than validity and reliability. An important concern for my research is to describe clearly the characteristics and dynamics

of teaching and learning through technology in Pakistani public schools so that comparisons can be made with other developing countries.

I used different strategies to ensure trustworthiness and credibility in my research. These included my choice of various methods, such as focus groups through which I ensured the involvement of and engagement with my research participants, in-depth interviews, participant observations, and document analysis. I also tried to include in my data analysis both common practices and behaviors with regards to the use of educational technology along with unique and unusual practices. I tried to find the reasons for unusual behaviors and include these in my analysis. I reconfirmed data with my research participants in order to present an accurate picture of the complexities of introducing computers in public schools in Pakistan in the data. Throughout my fieldwork I maintained a field journal to enhance self-reflection.

My main focus was directed not by the question 'How do I make my inquiry repeatable' but rather with the question 'where is the information located and how to get it'? This was the reason for my choice of a small-n purposive sample, for it offered me the opportunity to get more qualitatively rich information and see it more reflexively.

Ethical Issues

Ethical issues in qualitative research are often very delicate and subtle. As a qualitative researcher I am asking my research participants to "grant access to their lives, their minds, [and] their emotions" (Lofland and Lofland, 1984, p. 25).) Important issues such as possible harm, confidentiality, anonymity, possible benefits, purpose of research etc. need to be addressed as clearly as possible. I knew that I was going to spend a lot of time with my research participants. I spent in fact eleven months doing my fieldwork and,

during this time I continuously interacted with my research participants, so it was inevitable that I developed some sort of close personal involvement during the interviewing and participant observation phase. For this reason, it was important for me to explain to my respondents how important it was to me to protect their identity and privacy. This was important both ethically and also because it allowed them to be even more open and honest with me during our interview or focus sessions. I tried to be completely honest with them with regards to explaining the purpose and objectives of my research.

Before leaving for my fieldwork I had prepared an informed consent form. This document informed the participants about the overall purpose of my research and its main features. It ensured my research participants that their personal anonymity and confidentiality with regards to the data they provided would be maintained. I also mentioned the potential benefits to the participant in terms of increased awareness about the important changes taking place in Pakistan's public schools.

An important issue in the context of participant observation is the protection of privacy. I protected the identity of all my participants and schools by ascribing pseudonyms to them whenever I cite or quote them within the text. The final data that I present is a result of coding, which further removes any possibility of the participants' identity being discovered. Similarly, I avoided providing any details of the surroundings of the schools or the particular titles of officers that might lead to any sort of identification. The list of names corresponding to the pseudonyms remains on the hard disc of my computer and only I have access to it. I also tried to reciprocate the help of my

research participants by giving my time to help out, provide informal feedback, and being a good listener.

Recruitment strategy data management and analysis

Sampling: Sample type, size and techniques

My sampling strategy deliberately included participants whom I deemed to be the richest sources of information in the context of the introduction of technology in Pakistani public schools. I used a maximum variation purposive sample strategy to choose my research participants. A purposive sample involves approaching people who are in the researcher's opinion, knowledgeable about the topic of inquiry, accessible and able to make a difference to the research process and thus the situation at large.

Maximum variation purposive sampling made more sense for my research objectives and was also consistent with my framework of critical theory, which aims at 'catalytic validity' rather than validity in a positivistic sense. Catalytic validity refers to the researcher's ability to increase the self-understanding and self-direction of those she studies. My theoretical framework supports the use of purposive sampling in contrast to random sampling, which seeks to depersonify the research process at every stage. In using maximum variation purposive sampling, the people or organizations are deemed to expand the variability of the sample. The composition of the sample is emergent and evolves over the course of the study.

As such, my belief that my participants construct their worlds and attach meanings to them, combined with my research objective of exploring how power relations play out when technology is introduced in public education, prompted me to use a purposive sample. Purposeful sampling seeks information-rich cases, which can be studied in depth

(Patton, 1990). To draw out the 'multi-versions' of different stakeholders I decided to recruit a purposively small but varied sample. I drew insight from Lincoln and Guba (1985) who argue that the most useful strategy for the naturalistic approach is maximum variation sampling. By using maximum variation purposive sample I hoped to describe in my research the central themes or issues about educational technology that cut across various participants' accounts. As Patton (1990) argues, "any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared aspects or impacts of a program" (p. 172).

My initial goal was to interview a total of 24 respondents, who would include policy-makers, administrators/bureaucrats at the federal, provincial and district levels, and principals, teachers, and parents. It was crucial for me to restrict the number of respondents, as in-depth interviews take a lot of time. My theoretical framework also required a lot of interactivity. My aim was to establish a relationship with my research participants that were mutually beneficial. As stated earlier, validation is not the prime motive of the critical research; thus, for me, creating a critical awareness and starting a dialogue with my research participants about the social relevance of issues involved in introducing technology in education was very important.

This could only be done by spending more time with fewer respondents. Even so, out of the 24 research participants chosen I was only able to complete twenty-one interviews. One research participant went into labor (childbirth), two went abroad and could not complete their interviews and one participant changed his mind and dropped out half way through. I interviewed three policy-makers (all males), four bureaucrats (two male and two female), four school principals (one female and three males), six teachers (four male,

two female), four parents (two males and two females). Apart from in-depth interviews I also conducted five focus groups with 4-6 research participants in each group. Three groups included parents and two were exclusively teachers' focus groups. I held focus groups to see how different group participants attached meanings to the use of technology in education, and to elicit their various perspectives on education and educational technology. The main aim in holding focus groups was to identify the issues most relevant to different sets of research participants.

Since one of the main reasons for using a maximum variation purposive sample was to recruit and interview participants with relevant knowledge about educational and educational technology-related issues in Pakistan, I, therefore started my recruitment strategy by asking questions such as: Who decides what technologies are to be introduced in public schools in Pakistan? Who is in responsible for designing projects related to the implementation of computers in schools? How do stakeholders such as teachers and parents view the use of technology in education and how will the use of technology affect their lives? Focus groups, my key informant and informal conversations proved very helpful in identifying the sample of research participants for in-depth interviews. Once the research participants were identified I started contacting them by phone to find out how willing they were to participate in my inquiry.

Data management and analysis

I organized the data gathered during the fieldwork in such a way that descriptions would not end up being detached from the contextual aspects in which data was collected. For example, because I audio-recorded most of the interviews, at the beginning of the first session I asked each interviewee to give a brief biographical account of him or

herself. At the end of each session I use to record my impressions about the interview, the interviewee, non-verbal behavior, the interviewee's ease or discomfort with certain topics, issues I wanted to explore further with the particular interviewee, etc. I took photographs, and maintained detailed field notes along with a field journal in which I recorded my own reflections and daily analysis of research activities in the field along with my impressions of how the day had gone by entering both personal and analytical accounts in the evening. Maintaining field notes and the daily field journal in fact helped me in continual reflection on the special and temporal conditions throughout my relatively long research period and really helped me stay focused on my research objectives.

For a critical reading of the data I used multiple methods such as reflexivity, treating interviews as stories, discourse and rhetorical analysis within texts. I used historical reflexivity by looking at the context and conditions in which various documents and records were produced. In my final analysis of the introduction of educational technology in public schools in Pakistan, the conditions that I observed while collecting data along with historical grounding of educational issues in Pakistani context provided an important reference point for comparatively weighing the merits or demerits of introducing technology in Pakistan's public schooling system. I analyzed policy reports, documents and texts in conjunction with interview transcriptions. While analyzing the text I paid special importance to the construction of discourse about technology and its role in education, various claims within such discourse, and where these claims were coming from. I also analyzed how my research participants were

reproducing such discourse in making meanings and sense about technology-related issues in education.

Data analysis and coding

I drew insights from Berkowitz (1997) on coding and analyzing my data. For initial analysis I started by looking for patterns and common themes on the responses of interviewees about specific topics. For example, how did respondents describe the role of teacher, teaching methods, expectations from education, schools infrastructure, school management, hierarchy, economic issues, role of computers in learning, etc.

I also reflected on how emerging patterns address the broader study questions and objectives of my research. I also looked for what was not being said and tried to reflect on the reasons why respondents did not address certain issues.

I found there were some deviations from standard patterns or responses. For example at least a couple of teachers were using computers in the sense of integrated curriculum. In another case, one school had introduced computer instruction in grades 6-8. In such conditions I tried to discover any factors that could help in explaining such atypical responses or behaviors. While analyzing data, I looked for culture specific experiences and interesting stories emerging from the responses of my research participants and tried to use respondent's experiences in seeking answers to the broader study questions that my inquiry raises.

Coding

I tried to make sense of qualitative data that I collected by labeling and assigning meanings to various pieces of information. Coding helped me to enable and organize large amounts of data. It helped me to find out patterns that would be other wise very

difficult to identify by reading the transcribed texts alone. In this respect I used a three-phased coding strategy. In the initial phase I started by generating numerous codes or categories as I read through responses of my research participants. However, I ended up having a huge variety of categories. In the second phase I looked for similarities between different categories and reflected on the possibilities of merging some. On the other hand some categories were too broad and needed to be sub-divided. Thus second phase was about narrowing down, and eliminating categories that I thought were less useful and reorganizing categories. In the third phase I looked for ideas that were repeated that could be classified into larger themes that connected different categories. I have discussed the major themes that emerged from my data in chapter 6 of my thesis.

I have to admit that a number of issues came up during the field research that I had not anticipated. This resulted in a number of changes that I was forced to make while I was in *situ.* Insights were gained and were incorporated at almost every step of my fieldwork. However, working from the standpoint of critical theory and employing a critical methodology I had a better chance of understanding and explaining the dynamics of the introduction and use of educational technology for knowledge creation and knowledge construction in a developing country like Pakistan.

CHAPTER 5

EDUCATION POLICY MAKING IN PAKISTAN: A SOCIO-POLITICAL AND HISTORICAL OVERVIEW

Introduction

Since Pakistan won its independence in 1947 from British rule, successive governments have chalked out a number of educational policies and other programmes, schemes and projects to improve the situation of education in Pakistan. Unfortunately, none of the efforts has been sufficient to make a difference in the dismal situation of education and social development in Pakistan. A critical analysis of educational policies and plans in Pakistan reveals that policy-making and planning in Pakistan is largely marked by rhetoric, grand schemes based on a naive denial of socio-political and economic realities and lack of commitment by the educational and financial establishments of the country.

Organization of the Chapter

In order to examine any educational system it is important not only to examine the formal educational institutions but also the inter-related socio-political, cultural and historical dynamics of the society that intersect with education. It is in this context that I look at educational policy-making in Pakistan. I have divided the chapter into six sections. The first section 'Education in Pakistan: The numerical dimension', provides a brief description of the current state of the educational situation in Pakistan. The second section begins by tracing the educational policy-making and planning practices from the time of the birth of Pakistan in 1947, titled 'Educational policies and plans from Liaquat Ali Khan to Yahya Khan' (until 1971). The third section, 'Educational policy-making and planning under Bhutto', describes the socio-political conditions in which educational

policy-making and planning took place between 1971 and 1988. The fourth section highlights the socio-political conditions that affected educational policy-making in Pakistan during the Zia period, in this section covering educational policy-making and planning practices between 1977 and 1988. The fifth section covers the 'post-Zia' period of 1988-1999. The sixth section deals with the current period of educational policy-making and planning and also examines the latest trend in Pakistani educational policy that places such a heavy emphasis on the use of educational and information technologies as the panacea for all educational problems in the country. While discussing the various education policies and the five-year plans (FYPs), I refer only to the salient features of these and analyze their orientation, performance, and the factors behind their ultimate success and/or failure in the end. However, along with a discussion of various policy phases in terms of time, I will also discuss the spatial dimensions in terms of the political (or military) leadership so as indicate that policy-making was not pursued in a political vacuum and that these dynamics shaped education policies to a considerable extent.

Education in Pakistan: The numerical dimension

Let me start with some basic facts. Pakistan ranks among the bottom 30 countries of the world in terms of the Human Development Index (HDI). With respect to education, it ranks among the bottom 15 countries of the world (UNDP, 2003b). A look at the comparative data from developing countries shows how dismal the situation really is. For example, the adult illiteracy rate in Sub-Saharan Africa is 37%, while the adult illiteracy rate in Pakistan is 56%. Regionally, as well, Pakistan is located at the bottom of the educational index. For example, the net primary enrolment in Pakistan, 46%, is the lowest in South Asia. Even if we combine the enrolment rates of primary, secondary and

tertiary education Pakistan's total of 36% is much lower than the regional average of 54% (SPDC, Social Development in Pakistan. annual review 2002-03).

With only 1.8% of the G.D.P. public spending on education Pakistan is also the lowest in the region in this respect. There are only 12 countries in the world that spend less than 2% of their GDP on education; Pakistan is one of those 12 countries (UNDP, 2003b). The state of affairs looks even bleaker when we analyze Pakistan's public expenditure on education as a percentage of its total public spending. With a mere 7.8% spending on public education Pakistan ranks among the bottom five nations in the world (UNDP, 2003b). Pakistan also has the lowest ratio of female to male enrolment in the region. The situation gets even worse when other factors like gender/class disparity and high drop-out rates are taken into account.

Data from the Pakistan Integrated Household Survey (PIHS) indicates that male and female literacy rates are 57% and 29% respectively (PIHS, 2002). Just as there are huge gaps between male and female literacy rates, there is similarly a large urban and rural disparity, not to mention the regional disparity which also exists in Pakistan. The literacy growth rate in Pakistan has failed to keep pace with the population growth rate. It has consistently been less than one third of the population growth rate. In other words, the majority of the Pakistani population is illiterate and this number is growing rapidly having increased from 28 million in 1972 to 46 million presently (Population Census Reports, 1972, 1981 & 1998, PIHS, 2002).

Despite different measures taken by successive governments, it is evident that participation in education is steadily declining[25] and slipping out of the hands of the political leadership and policy makers. PIHS (2002) data indicates that there are 13 million children in the age group 5-9 years not in school, out of a total of 50 million. The Net Primary Enrolment Rate (NPER)[26] stands at 46%. The net secondary enrolment rate (NSER) also reflects a similar story; overall this rate is as low as 10% with huge gender, class and regional disparities (PIHS 2001-2002, SPDC 2002).

In addition to the above-mentioned problems, Pakistan faces a serious challenge in its high dropout rate among students, who abandon their studies before completing the primary or secondary level. An analysis of the dropout trend in conjunction with the low enrolment trend presents a very depressing scenario for Pakistan's educational future. Just as the enrolment trend shows a drop over the years the dropout rate has increased, from 40% in 1996 to 54% in 1999-2000, to cite but one example. Again, there is a marked gender disparity in dropout rates as girls tend to drop out at a higher pace than boys.

The role and status of education in a society cannot be understood outside the socio-cultural, historical and political framework. In the end, schooling and education are tremendously affected by how relationships are assembled between people and how over the course of time relationships are modified with different political and economic

[25] With a population growth rate of 2.3 per cent and an average increase in literacy of 1.4 per cent over the last ten years, the number of adults (over fifteen years of age) who cannot read, write or do simple calculations has steadily increased, from 28 million in 1972 to 46 million in 2003(see SPDC annual report 2002-2003).

[26] Conventionally the Gross Enrolment Ratio is used to show the general level of participation in a given level of education. However Net Primary Enrollment Rate (NPER) is a more refined indicator as it shows enrolment of students by specific age groups.

developments and changes in cultural ethos. The education system in Pakistan needs to be analyzed not only in the context of policy-making and planning as has often been attempted (Chudary, 1999), but also in the light of the socio-political situation in a post-colonial society that is still being governed in a colonial manner by a military-bureaucracy oligarchy. Political leaders, the majority of whom are from the landed elite and who bear close relations with the bureaucracy and military, are the norm, whereas truly democratic interludes have been rare in the last half-century.

In the following space I provide a brief account of the history of educational planning and policy making in Pakistan since its birth in 1947. I contextualize various educational policies and plans within the socio-political conditions obtaining when they were designed and implemented.

Historically, educational policy-making in Pakistan has been pursued on two levels. On the first level, various educational conferences and policy initiatives laid down the broad principles that were to serve as a road map. On the second level are various policy initiatives that were latent in the various five-year plans (FYPs). While in most policy-making environments FYPs make provisions for the resources needed to execute agreed-upon policies, in Pakistan this practice is not very clear. An apparent reason for this is the constant power struggle between the political leadership and the military-bureaucratic oligarchy. A look at the various policies and FYPs (discussed below) shows that seldom did the educational aspects in the latter flow from the former and that, in some situations, the education-related dynamics of the FYPs contradicted the corresponding educational policy.

There are two interrelated paths along which the history of educational-policy making in Pakistan can be traced: first, the different educational conferences and plans that various regimes initiated from time to time; and second, the modifications and addenda made to these policies in the various FYPs. Education is on the concurrent list[27] of jurisdictions under the constitution of Pakistan. As such the responsibility for education has been divided between the federal and the four provincial governments, namely, Punjab, Sindh, North West Frontier Province (NWFP) and Baluchistan[28]. Especially notable in this respect is the retention of curriculum and finance by the federal government. Control of finances by the federal government is often seen by the provincial educational authorities as an attempt by the federal government to control the nature and direction of education.

Educational policy-making and planning in independent Pakistan: from Liaquat Ali Khan to Yahya Khan (1947-1977)

Pakistan achieved independence from over a century of British colonial rule in August 1947. At independence, 85 percent of the population was illiterate. In backward regions of the country the literacy rate was even lower with rural women virtually having a zero literacy rate. The first national educational conference was held soon after independence in August 1947. Mohammad Ali Jinnah, the first Governor General of Pakistan, stated in his address to the conferences:

> ...The importance of education and the type of education cannot be over-emphasized...there is no doubt that the future of our State will and must greatly depend upon the type of education we give to our children, and the way in which

[27] Jointly administered by both the federal and provincial governments
[28] Prior to 1971 East Pakistan was the fifth province.

> we bring them up as future citizens of Pakistan...we should not forget that we have to compete with the world which is moving very fast in this direction (GoP, 1948).

A number of committees on primary, secondary and adult education were struck. The overriding consensus among various committees formed at the conference was that universal and free education was essential. For example, both the primary and secondary educational committees were of the opinion that the "...national system of education should be based on strong foundations of free and compulsory primary education" (GoP, 1948). Similarly, the committee on adult education highlighted the urgency of introducing literacy among the masses. It suggested the setting up of a permanent system of adult education, closely linked with compulsory primary education. A target of 25 years was set to solve the problem.

However, despite this loud rhetoric about the need to educate the Pakistani population, no necessary infrastructure or institutional support was provided to implement the recommendations made by the committees. Soon after the death of Jinnah in 1948, the country descended into a political turmoil that rearranged the priorities of the political as well as the administrative leadership of the country. For the former, political survival was more important, whereas for the latter it was the consolidation of power relative to that of the political leadership that set the tone for policy-making. It was in this context that the National Plan for Educational Development was articulated.

In 1951 the second educational conference was held to develop a six-year (1951-57) National Plan of Educational Development (GoP, 1951). The plan was presented as "the first deliberate effort to anticipate and provide for our requirements in various fields of

education for a period of six years" (GoP, 1951). The principal constraint identified by the plan was the lack of trained teachers along with inadequate infrastructure– especially in terms of school buildings, teaching aids, scientific equipment, etc. It was acknowledged that two thirds of children in the age group 6-11 were not in school. A target was set to enroll these children in primary schools by the end of the plan period, i.e., 1957. To improve adult literacy the Village Agricultural and Industrial Development (V-AID) program was launched whereby literacy centers, along with teachers and teaching materials, were to be provided to villages. The target was to add 2.8 million adults to the literate population each year during the plan period.

However, the efforts and expenditures made during the decade 1947-57 failed entirely to produce the desired results. A review of the decade-long efforts showed that the literacy rate actually remained unchanged or even declined, albeit marginally (Khawaja, n.d.). "At the end of 1950's, the literacy ratio went down by .1% from 16.4 percent to 16.3 percent after a decade" (GoP, 1951). This failure was attributed to the fact that "the administrative and organizational arrangements were unstable" (GoP, 1951).

What was not acknowledged was the fact that, during this period, the country had virtually no political leadership that could guide the policy-making process or the execution of what was already planned. Instead, Pakistan saw as many as seven different governments (if one could call them so) come and go. After a decade of independence from colonial rule, the country was still without a constitution. This period also saw the rise to power of the military-bureaucratic oligarchy and the first of the martial laws imposed on the country. The military regime of General Ayub Khan claimed that its coming to power was a 'revolution' and tried to gain legitimacy by severely criticizing

the erstwhile political leadership (Gauhar 1993). It was in this atmosphere that the next educational policy was enacted.

Although the educational conferences of 1947 and 1951 clearly acknowledged the disheartening state of literacy in Pakistan, no precise targets were set to eradicate illiteracy by the end of the first five-year plan[29]. It was somehow expected that a universal system of free and compulsory primary education for all would be in place within twenty years i.e., by about 1975-80. The plan proposed the additional 4000 new schools to the then existing 15,602 schools in the country. It was claimed that "the foundations laid for primary education during this plan period will permit a rapid advance on a sound and confident basis towards the goal of universal free compulsory primary education" (GoP, 1959).

In the absence of political leadership, educational-policy making was left to the discretion of a bureaucracy that had inherited its educational vision from the colonial government. This educational vision rested on the twin foundations of developing a ruling/administrative class from the elite of the country and framing educational objectives related to the overall aim of increasing productivity with a strong emphasis on exports. While this educational vision had suited the British colonial government when it came to controlling the vast majority of its Indian colonial subjects and safeguarding its trade interests in the region, it was clearly not suitable for a new independent nation.

[29] The practice of making grand plans without conducting proper research and with out setting up goals and targets continues today. My research in the introduction of computers in the classrooms a current initiative by the present government so far indicates a similar pattern.

1959 Education Policy

In 1959 a Commission on National Education was formed with a mandate to submit a report on the educational requirements of Pakistan. The report put forth by the commission emphasized the need for compulsory Universal Primary Education (UPE). The report also emphasized the need for religious education, more female teachers, and more resources and funds to promote especially primary education.

The second five year plan (1960-1965) came up with an over all objective to promote education for economic development. Though some improvement in primary enrollment was recorded during the second five-year plan period, adult education and literacy programs made no progress at all despite the fact that the second plan acknowledged that, previous campaigns to eradicate illiteracy had only achieved limited results (GoP, 1959). Even with this acknowledgement, no monies were set aside to eradicate illiteracy in the second plan period.

The third five-year plan (1965-1970) aimed at expanding the base for primary education. The primary goal of the plan was to increase primary enrollment from 45% to 70% by 1970. By this time the tradition of five-year planners making tall claims had been set in place. The third plan aimed "to provide an educational system which would facilitate transition into an era of science and technology, promote political, social and economic development and bring the country's spiritual and cultural heritage into harmony with the contemporary world" (GoP, 1965). It also pledged to create the conditions that would allow the country's youth to develop their individual capacities and character and take up the task of nation-building.

An analysis of the initial phase of educational-policy making and five year planning in Pakistan (1947-1970) reveals a certain pattern. First, policy makers and planners were

always fully aware of the dismal situation of education in Pakistan while planning and formulating educational policies. Second, each conference and five year plan laid down in detail the barriers or hindrances standing in the way of achieving educational goals. Third, all these conferences, reports and plans aimed at unachievable or unrealistic goals for the future of education. This fact becomes evident when those goals are measured against the financial resources allocated to achieve those targets. In some cases, for example, such as when it came to the campaign to 'eradicate illiteracy', no funds were allocated at all in any of the initial three five-year plans. Fourth, we find a tradition of grand rhetoric and lofty claims about the future of Pakistan right from the beginning. Finally, each plan acknowledged the failure of past plans and policies, but continued to set unrealistic targets (Haq, 1976).

A quick look at the broader national political circumstances and the international discourse on development during this period can help in contextualizing and better understanding the rationales behind such educational planning and policy-making. As Noman (1990) states, among other factors, "the first decade of economic policy making was characterized by ... miserly allocations for education and health established a pattern of government negligence of social sector provisions, particularly for the poor. Allocations for social services were squeezed by heavy defense expenditure for military security against India" (p.15).

Internationally, the development discourse was dominated by the modernization theory, which emphasized economic development, bi-polar oppositional relationship between modernity and tradition, and conversion of less developed societies to the Western model of development. U.S President Truman's four-point program of

development aid also marked this period[30]. Policy-making in Pakistan was thus influenced by the global development discourse and also benefited from Truman's program by virtue of being a military ally. During this period Pakistan entered into four major alliances with the US: two military and two economic aid alliances. Additionally, it reaped windfall economic profits from the Korean War and adopted American economic and educational paradigms.

Evidence of this may be seen in the adoption of the "economic/industrial development" policy by the military regime of general-turned-president, Ayub Khan. The government decided on providing incentives and protection to the private sector. In many cases where the private sector was unwilling to invest, the state-run Pakistan Industrial Development Corporation (PIDC) provided capital and started projects that were then handed over to private sector either through public shares or partnership arrangements. In pursuit of rapid industrialization, the government neglected agricultural development[31]–despite the fact that Pakistan's agricultural products were major exports and a source of vital foreign exchange earnings.

The allocation patterns of the first three FYPs thus clearly indicate that education was not a priority area. Here the divorce between rhetoric and practice is abundantly clear. As mentioned above, despite the emphasis on eliminating illiteracy and providing universal primary education (UPE) on paper very few funds were allocated to improving the situation of education or for that matter the overall social development of Pakistan. The

[30] Truman announced that, "the policy of U.S to aid the efforts of peoples of economically underdeveloped areas to develop their resources and improve living conditions" (Ohlin 1970, p.25).

[31] It is important to remember that although the income of the large land owner class who had political clout did not rise like that of merchant communities (mostly muhajirs) this class still benefited by obstructing proposals for redistributing land.

framework adopted by the Ayub government was neither concerned with nor took any measures to alleviate mass poverty. Such lack of concern was reflected in the allocation of government resources; as Noman (1990) states "barely 4% of government expenditure was allocated annually for education, health and social services. Moreover, when one considers that most of this expenditure was targeted towards the urban middle class, there was virtually no provision for education or health of largely illiterate and malnourished population" (p. 18)

How could politicians and policy-makers say one thing and then do another? Has there never been any system of accountability in Pakistan? To answer these questions let me, briefly map out the internal political landscape of Pakistan in the first fifteen years of its existence and how it led to a political takeover by a military-bureaucratic oligarchy and the non-democratic system of governance that exists till this day in Pakistan. Waseem (1994), writing about the independence of Pakistan points out that, " ... the transfer of power had taken place between two governments...a closer look at the whole episode reveals that actual transition took place between the British bureaucracy and the emergent Pakistani bureaucracy" (p.136).

Jinnah, the leader of the Muslim League, the vanguard party that led the drive for a separate state for the Muslims of India and Pakistan's first governor general, died soon after the birth of Pakistan (1948). Before his death there were rumors that considerable differences of opinion had emerged between Jinnah and Liaquat Ali Khan the Prime Minister. Within three months of its birth Pakistan went to its first war with India over the sovereignty of Kashmir. The next seven years saw a game of political musical chairs that was marked by political intrigue, palace coups and eventually the first military coup

in 1958. After the death of Jinnah in 1948, Khawaja Nazimuddin became the governor general. In 1951 Liaquat Ali Khan (prime minister) was assassinated and Nazimuddin became the prime minister, while Ghulam Mohammad (an ex-bureaucrat) became the governor general. In 1955, Ghulam Mohammad gave up his position as governor general for another bureaucrat named Iskander Mirza. It took Pakistan 9 years to come up with her first constitution and Mirza became the first president of Pakistan. Soon after that, in 1958, Mirza abolished the constitution and declared martial law. Field Martial Ayub Khan ousted Mirza and took over the presidency. In 1965 Pakistan went to a second war with India over Kashmir. In 1969 Ayub Khan had to resign due to the rapidly deteriorating political conditions and unrest in the Eastern wing of Pakistan. General Yahya Khan assumed the presidency and declared martial law again. In 1971, General Yahya Khan resigned and Zulfiqar Ali Bhutto became the chief martial law administrator (CMLA). In 1971, Pakistan went for the third time to war with India, this time over Bangladesh. In 1971 East Pakistan seceded from Pakistan and become the independent nation of Bangladesh.

An analysis of the events that took place between 1947 and 1971 confirms Waseem's argument that power was transferred in actuality to the bureaucracy and military and not to an independent sovereign state. The key players in politics and power (except Jinnah and Liaquat Ali Khan, who disappeared from the scene very early) were either bureaucrats or military personnel. In Pakistan's case it has always been the administrative wing (bureaucracy and military) and not the political wing that has represented and still represents the supreme authority of the state.

It is interesting to note the background, training and orientation of the group of military and bureaucratic personnel who took up reins of power after the deaths of Jinnah (1948) and Liaquat Ali Khan (1950). As Feroze Khan Noon, an ex-prime minister of Pakistan noted in his memoirs, "the leading lights of the Ghulam Mohammad group had one interesting attribute in common in so far as their perceptions of Pakistan...were concerned. They were men who have grown grey in the service of the British and they favored very close relations with the west" (Noon, 1969, p.248). According to Waseem (1994) "Military intervention in politics [has become] almost a structural feature of bureaucratic polity of Pakistan" (p.144).

It is, therefore, not surprising that as early as 1949 Pakistan was spending twice as much on its military than on development projects. According to Noman (1990), "this unfortunate pattern of resource allocation has persisted since partition. Its effects have become obvious; Pakistan has a powerful army and a literacy ratio which is one of the worst in the world" (p. 19).

It is evident from the preceding discussion that the initial education planning in Pakistan was done by a governing elite that was non-representative and that was influenced by international development discourse on the one hand and by enmity with India on the other. Additionally, regimes in this period were not accountable to the populace. Furthermore, the lack of a national bourgeoisie made matters worse (Alavi, 1983). An analysis of the first three FYPs shows that despite the rhetoric about fighting illiteracy and promoting universal primary education (UPE), more funds were allocated to secondary and post-secondary education from the small budget that was set aside for education. Such a decision was based on the economic view that the primary task of

education was to provide a trained workforce for industrial development. Over 56% of funds allocated to education in first FYP were thus earmarked for college/university education. The rationale for this first plan in particular was the need for highly qualified personnel to expand the bureaucracy and to fill positions left vacant by British and Hindu members of the population.

Only 18% of the meager funds allocated to the education sector went for the much talked about UPE. Ironically, even these funds were not fully utilized. Technical education, which had been stressed in almost all educational conferences and policies, was given less than 9% of the total funds. The second and third FYPs repeated the same practice, though there was a slight increase in the budget for primary and technical education in the second and third FYPs, respectively. Once again, however, the increased funds were never fully utilized (i.e., primary education budget was increased from 18% to 24.8%, but only 14.7% was spent). By the end of the second FYP, the dropout rate from class 1 to class 2 had increased to more than 50% (Rauf, 1983, p. 279). The deteriorating situation of education was fully acknowledged by the third FYP in which the budget for primary education was increased to 30%. In keeping with the previous pattern, however, only 13.6% was actually spent during the plan period.

It is interesting to note that education and social development continued to suffer tremendously despite the fact that Pakistan had an excellent record of economic development during the 1950s and 1960s, with impressive growth rates in the range of 6-9%. Yet by 1971, 78% of the population over five years old was illiterate. The model of development adopted in the 1960s promoted inequalities as a necessary pre-condition for

economic growth[32]. It led to both regional and class inequalities. By this time twenty-two families were controlling almost the whole of the country's wealth. "Between them they owned 66% of industry, 97% of insurance and 80% of banking" (Noman, 1990. p. 41). By 1970, the disparity of per capita income had risen to 61% (Haq1976, p. 266), while the rise in the growth rate and per capita income was accompanied by a sharp fall in living standards for the majority of the people of Pakistan. Despite doing well economically, "in terms of percentage of national expenditure devoted to education, Pakistan's performance under Ayub was the worst in Asia" (Noman 1990, p.41. also see World Bank: Education Sector Working Paper, 1974).

Educational policy- making and planning during the Bhutto Era (1971-1977)

It was not till the 4th FYP that some funds were directed towards improving adult literacy. Unfortunately, the 4th FYP was abandoned due to internal instability and foreign threats; instead, planning continued on a yearly basis till 1978 when finally the fifth FYP was formulated. In 1970 once again a commitment to improving the educational structure of Pakistan was reaffirmed. The government came up with an education policy that was based on a commitment to 'the objective of universal elementary education'. The policy lamented that, "the attainment of the goal...seems to have receded further and further with the lapse of time and Pakistan today has one of the highest rates of illiteracy in the world" (GoP, 1970). Outlining the basic principals and concepts the educational policy of 1970 stated that:

[32] The current model of economic growth dominated by neo-liberal tone is only a more intense version of the 1960s model. A good indicator is the gap between the rich and poor that has doubled in the last ten years in Pakistan.

> Education and training are critical inputs in the economic effort of the nation. Without harnessing the vast human resources available to Pakistan, the task of sustaining and accelerating economic development would remain unfulfilled. In this regard the basic objectives are, on the one hand, to broaden rapidly the base of education with a view to attaining the ideal of universally literate and productive society and, on the other, ensure a continuous supply of highly trained persons capable of providing imaginative and creative leadership in different spheres of national activity"(GoP, 1970).

The educational policy of 1970, which aimed at free and universal enrollment up to Class 5, was never implemented due to war with India, the secession of East Pakistan, and the collapse of the military government of General Yahya Khan. With the new government came a new educational policy in 1972 that was far more ambitious than the previous policies. This policy aimed at:

> Eradicating illiteracy within the shortest possible time through universalization of elementary education and massive adult education program...equalizing access to education through provision of special facilities for women, under-privileged groups and mentally retarded and physically-handicapped children and adults in all areas in general and the backward areas in particular. (GoP, 1972).

The 1972 educational policy declared that education would be made universal up to Class X for all children throughout the country in both government and privately managed schools. Private schools would be suitably supported for the loss of fees incurred by them. Education policy-making during this period was guided by the

ideological orientation of the Pakistan People's Party (PPP) led by Zulfiqar Ali Bhutto. Initially, the policy was based on a public-private partnership with the latter providing free education (duly subsidized by the government) while retaining their independence. Later the PPP government nationalized all private educational institutions and brought education totally under state control in the name of Islamic socialism. During this period more attention was focused on largely symbolic issues such as a 'national uniform' and the medium of instruction rather than on any substantial issues such as restructuring the country's educational system.

The shift of focus in the 'New education policy of 1972' needs to be viewed in the context of the political situation of the country at that time. The Pakistan Peoples' Party (PPP) was able to mobilize students and masses against the elite structure created by the military regimes of generals Ayub and Yahya. It won its mandate based on a promise to dismantle the elite structure and replace it with an efficient public service. Though the rhetoric used by the PPP was to expand the role of the public sector in the economy, in reality the policies implemented by the party once again "enlarged the functions and duties performed by the Civil Service" (Noman 1990, p. 62, also see Waseem, 1994 for a detailed understanding of the Bhutto period).

Politically the PPP symbolized a movement for expanding civil liberties and economic reforms to ensure equitable distribution of wealth, but it failed to achieve any of these goals due to a "lack of serious commitment to any of these objectives" (Noman 1990, p. 69). The state intervened into private capital and redistributed it in favor of those who had its patronage. The decision to nationalize schools was just a way to show people that the government was committed to fulfilling its promise to the masses, whereas, in

fact no research had gone into making that decision, Noman (1990, p. 87) quotes a former education minister describing the educational strategy, "as a way of fooling the people, since the money to finance schemes was never made available". By leaving the private sector's role ambiguous, along with no strategic planning behind the policy to nationalize education, led to confusion and uncertainty. Some good schools became state-owned enterprises marked by inefficiency and corruption. Recruitment for educational institutions was made on a political basis rather than on teaching abilities or qualifications. This system is still very much in place and has become the hallmark of public education no matter who is in power. Such follies have resulted in a persistent public perception that official schemes are always incompetent and inadequate. My research shows that, instead of taking measures to correct the situation, a similar logic is now being used officially in educational-policy making as an excuse to privatize public education by implying that only private schools can deliver better education.

Keeping in view the PPP's socialist manifesto and its electoral pledge and ambitious educational policy, one would have expected increased allocations for educational services, but in reality it once again diverted resources to the military and expanding Civil Services (the bureaucracy), and shelved the plan for expansion of social services. In the absence of funding, schemes launched under the 1972 educational policy such as free primary education were doomed to fail right from the beginning. Additionally, what little there was in terms of educational facilities in urban areas also disintegrated under the rhetoric of nationalism.

It is important to note that Ali Bhutto's government was the first government in Pakistan's history that enjoyed a popular mandate based on an adult franchise. There was

strong elite and bureaucratic resistance to the reforms that the Bhutto government wanted to implement. Nonetheless the PPP was able to go ahead with the proposed reforms. What is extremely unfortunate is the fact that new reforms remained at best an expression of intent as they were never backed up with institutional arrangements to implement them. For example, the utopian educational policy under the Bhutto government promised to establish 276,000 literacy centers, as well as recruitment of 225,000 additional teachers. It also aimed at opening another 2,200 'units' for the teaching of science at the secondary level and 3500 units for technical education (GoP, 1972, pp. 6, 10, 21). When one considers that such a grand educational expansion was to be carried out with the existing manpower and resources, the superficiality of educational policy and planning becomes apparent.

Educational policy making and planning during the Zia period (1977-1988)

Bhutto's government was overthrown by the military *coup d' etat* led by General Zia ul Haq in 1977. This led to a significant shift in political as well as educational priorities. Meanwhile the fifth FYP was presented in 1978 and it took into account some of the previous educational policy intentions, but as is always the case in Pakistan the new Military government came up with 'its own' National Education Policy of 1979. The fifth FYP lamented the past neglect of primary education that had led the country to a point where 78% of the population above 5 years of age was illiterate. It therefore, claimed to undertake:

> A fundamental reordering of national priorities in favor of primary education...a comprehensive approach towards primary education, which would include not

only the augmentation of physical facilities but also measures to reduce the drop-out rate, improvement in the quality of teaching and better supervision (GoP, 1978).

The plan proposed to double the per capita expenditure on education from Rs. 43 in 1977-78 to Rs. 88 in 1982-83, thus increasing the outlay on education from just under 2 % to 3.1% of the GNP. Rapid expansion in girls' education was also given high priority, at least in principal. The plan stated that, "all schools will be open for admission of girls and separate girl's schools shall be opened where essential" (GoP, 1978). Construction of 5,800 teacher's residences in the rural areas was also proposed to solve the problem of the non-availability of teachers in rural areas. It is important to note that, although the fifth FYP was presented in 1978, the new educational policy was not announced till late 1979.

As the policy was presented one year after the launching of the fifth FYP, therefore the target dates for primary universal enrollments of the age group 5-9 years old were changed from1986-87 to 1992. In other words, the government shifted forward the targets set by the fifth plan by 5 years. The policy once again lamented that; "nearly half of the nation's children and two thirds of girls do not go to primary schools" (GoP, 1979). The 1979 educational policy, in addition to other administrative measures to improve universal primary education, also proposed to reconstruct/improve 17,000 existing primary schools, open 13,000 new primary schools, mainly in rural areas, and establish 5000 mosque schools for boys, and 5000 *Mohalla* (community) schools for girls.

With the new educational policy under Zia's military regime, the trend shifted towards utilizing indigenous institutions. For instance the policy stated,

> ...In recognizing the great potentials of our indigenous institutions and patronizing them for brining about grater educational development...deviation from alien models and building up on what we already have, will make a great impact. (GOP, 1979).

This referred directly to the institutionalization of the *madrassah* and *mosque* schools without any attention to the structure or curriculum of these institutions. From Bhutto's so-called 'Islamic socialism' the priority and focus of the new military regime shifted towards 'Islamic Ideology'. This stance was evident in the subsequent educational policies and planning. However it is important to mention that, just as Bhutto had used religion (in the garb of Islamic socialism) as a slogan to seize political opportunity without any true commitment to either Islam or socialism, similarly Zia used Islamic ideology to serve his own political interests.

The first and foremost reason behind Zia's use of the Islamization slogan was the fact that the Jamat-e-Islami (the major religio-political party in Pakistan) was the only political force willing to form an alliance with Zia's dictatorship. Zia used Islam to legitimize his non-democratic rule by portraying Bhutto and his policies as non-Islamic and harmful to the Islamic Republic of Pakistan. Internationally Zia could get away with his hard-line Islamic policies as it served US interests in Afghanistan, where *Mujahideen* (the Islamic fighters) were fighting against the Soviets. As a matter of fact, under Zia government foreign aid, primarily from the US, kept pouring in until the withdrawal of the Soviet Union from Afghanistan. Thus when it came to educational policies, the only significant change was from Bhutto's emphasis on 'uniforms and nationalism' to Zia's stress on Islamization of education i.e. symbolic.

In overthrowing the elected government of Zulfiqar Ali Bhutto, Zia's junta sought legitimacy by targeting three areas in particular for Islamization. These were: law and the judicial system, the economy and education. A reading of the four policy initiatives from 1977 to 1988 shows that the more the military regime felt insecure, the more it emphasized Islamization. In terms of education, the government chose to concentrate on two sectors: a) non-formal education and b) 'so-called' Islamic education. Non-formal education meant among other things, institutionalizing the *madrassahs* (religious schools), especially those that were run by the religio-political parties sympathetic to the military regime. The emphasis on so-called Islamic education on the other hand was part of the Islamization ruse. A combination of the two was used to legitimize and justify the non-representative government of General Zia.

What was also notable during this period was the rapidity with which four education policies were formulated. On the average, there was a policy every two years. This ad-hocism was directly related to and was the result of the political dynamics of the country. Against this backdrop, the following were the salient features of educational policy under the Zia regime.

Under the education policy of 1981, a Literacy and Mass Education Commission (LAMEC) was set up (GoP, 1981b). LAMEC was later reconstituted as the National Education and Training Commission. In 1985, when Mohammad Khan Junejo became prime minister he presented a five-point program in which the National Education and Training Commission was yet again renamed as the Prime Minister's Literacy Commission.

Soon after announcing the 1981 education policy, the Government of Pakistan came up with another national education policy, introduced in 1983(GoP, 1983b) a ten point educational program that once again promised to change the poor picture of the Pakistani educational system (Khawaja, 1986). The 1983 policy focused on a national movement for literacy and mass education. Under this policy initiative, literacy was redefined as a basic reading knowledge of the Quran and religious texts. Religious texts such as the basic *Quranic Qaida* and the "*Yassarnal Quran*[33]" were made compulsory even at the graduate and post-graduate levels[34]. All government organizations were to make arrangements to impart literacy to their illiterate employees; all sorts of licenses (arms, driving, etc.) were to be granted only to literate persons. Incentives and rewards (for example, roads, dispensaries/health centers or the provision of electricity) were set up for communities that could achieve one hundred percent literacy, while all *deeni madrasas*[35] were requested to provide education at least in understanding of the Quran in addition to reading the Qur'an *nazra* (visually). Once again the role of technology, like radio and T.V., was emphasized, especially in the delivery of adult education.

Yet another education policy (GoP, 1984) was launched in 1984, just one year after the Sixth plan had been put in place. It is interesting to note that even though Pakistan was facing problems in terms of net aid flow during the fifth FYP and had to borrow additional funding from the World Bank with stringent conditions as part of structural adjustment loans (SAL), both the sixth five year plan, and the 1984 educational policy

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[33] The primer for learning of the Holy Qura'an.

[34] Order was issued that University degrees at graduate and post graduate level should not be awarded to the candidates who have completed the requirements for these degrees and passed requisite examinations, until they have imparted for this purpose the basic *Quranic Qaida* the "*Yassarnal Quran*".

[35] Religious schools. These are usually attached to the mosques, are funded through charity and administered by various Islamic sects and religio-political parties.

were once again so ambitious that their failure could have been predicted right from the beginning. According to Noman, the sixth plan "ran into immediate resource constraints. In the first year of the plan, foreign capital inflows were 20% short of the plan target. "...Consequently, the plan had to be replaced by a list of priority projects which conformed to a more realistic assessment of resource availability" (Noman, 1990, p. 173). The1984 educational policy aimed at establishing 25,000 literacy centers which were to be implemented federally by LAMEC with assistance from the Provincial Literacy Council and non-governmental voluntary organizations. Other projects launched under this policy included: afternoon school projects, *Iqra* projects, *Razakar* Muslim projects, NGOs, Volunteer Literacy Corps projects, *Sipah-e-Idrees* projects, Social Welfare Agencies, Village Literacy projects, and *Azafi* Literacy Centers projects, etc.

The national literacy program failed miserably and most of the projects launched under it failed to achieve the desired results. The *Iqra* project was a typical example of such a policy failure. The project hung on for three years from 1983- 1986 and was implemented in nine districts all over the country (GoP, 1989). The first year target was to make half a million people literate. When the project was evaluated it was found that only 18,000 had been made literate during the first year. This made the achievement level only 3.6% so that the project fell 96.4% short of target. Similarly other projects such as the *Razakar* Muslim (Muslim Volunteers) Project and the *Sipah-e-Idrees* (Army of Idrees) project were based on utilization of the *madrassah* schools. They not only duplicated the scope of other voluntary projects but also failed miserably to contribute to the literacy situation in the country.

The failure of the sixth FYP along with various projects launched under different National Education Policies, was a clear indicator that there were no short cuts for increasing literacy. As a matter of fact, in pursuit of unachievable goals, precious resources had been wasted in projects that were not only expensive and hard to monitor but also half of the new generation was denied primary education as scarce resources were diverted to literacy programs.

The seventh five-year plan was launched in 1988 and it once again changed the focus from mass literacy to expansion of primary compulsory education. After reviewing the past situation the seventh Five year plan concluded that:

> The education system suffers from chronic deficiencies. About forty % of the children do not have access to education. This has perpetuated a high rate of illiteracy. Primary education facilities are available to only 60% of the children in the age group of 5-9 years. Primary schools lack physical facilities; about 29,000 primary schools have no buildings and 16,000 schools have only one classroom. The target of one teacher and one room for every class, the minimum essential requirement for quality education, appears difficult to achieve even in the next few years...rural primary schools are at beset with a shortage of trained and qualified female teachers and teacher absenteeism is high. In rural areas, enrollment of girls is about one third of that of boys...an unattractive school environment has resulted in poor retention and a high dropout rate (GoP, 1988).

This time the strategy was to involve the private sector. The goal was set at achieving 80% literacy by 2000. Measures to achieve 80% literacy included the imposition of an *Iqra* surcharge (a tax placed initially on imports and later extended to other economic

activities to meet the needs of education and training). Other measures included mandatory provision of primary schools by housing developers[36]. This plan included providing a school for every child within a radius of 1.5 K.M., introducing motivational campaigns for parents to send children to schools, improving buildings and infrastructure. The seventh five year plan also aimed at detailed mappings of schools and opening mosque schools for communities smaller than 500 students, allowing boys up to the age of 8 years to join girls' schools if separate schools were not available, along with improvement and subsidization of textbooks.

Educational policy making and planning during the Post-Zia period (1988-1999)

The seventh FYP aimed at a total overhaul of educational facilities and structures, along with an expansion of the network. Everything came to a halt, however when Zia was killed in a plane crash on August 17, 1988 and Benazir Bhutto became prime minister, taking over the government on December 1st 1988. True to the national tradition, one of the first decisions of the new government was to sponsor a National Educational Conference so that a new educational policy could be drafted for a nation much in need of education and literacy. The educational conference of 1989 bewailed previous failures and once again proposed a mixture of various strategies were discussed above to attain UPE, although this time adult education was low on the priority list. Literacy and non-formal education were also merged and placed under other 'important aspects of education'.

If four different educational policies between 1979 and 1984 were too many, then consider five changes of government between 1988 and 1999– a period in which three

[36] The cost of school buildings was to be added in the cost of land and development charges and was to be paid by the purchaser.

prime ministers were dismissed and new elections held each time along with various interim prime ministers. Following is a table to providing a quick view of changes of government between 1998 and 1999.

- Benazir Bhutto (Dec 2, 1988 - August 6, 1990)
- Ghulam Mustafa Jatoi (interim, August 6, 1990 - November 6, 1990)
- Nawaz Sharif (November 6, 1990 - April 18, 1993)
- Balakh Sher Mazari (interim, April 18, 1993 - May 26, 1993)
- Nawaz Sharif (Restored by supreme court of Pakistan, May 26, 1993 - July 18, 1993)
- Moin Qureshi (interim July 18, 1993 - October 19, 1993)
- Benazir Bhutto (wins elections again, October 19, 1993 - November 5, 1996)
- Miraj Khalid, (interim, November 5, 1996 - February 17, 1997)
- Nawaz Sharif (wins elections again February 17, 1997 - October 12, 1999)
- Pervez Musharraf (overthrew Nawaz Sharif and declared Martial Law, October 12, 1999; on becoming President of Pakistan June 20, 200, he chose for himself the title Chief Executive of Pakistan)

The United Nations' World Conference on Education (Jomtien, March 1990) heavily influenced Pakistan's new education policy introduced in 1992 (GoP, 1992). The goals and focus once again shifted towards primary education. Although concerns were raised about early childhood care and development, an issue deeply linked with primary education, the 1992 educational policy did not address the issue of early childhood development (and although this issue was addressed in the next educational policy, no financial allocation was committed for this).

Realizing that Pakistan had been left far behind the rest of the world in both education and social development, the Eighth Five Year Plan 1992-1997 made allocations not only for recommendations by the National Education Policy (NEP) of 1992-2000, but also launched a Social Action Programme (SAP) (GoP, 1994). The SAP was a multi-structure programme that focused on the deprived segments of society such as rural areas and urban slums. It emphasized delivery of primary education and also included various programs for the provision of clean drinking water, sanitation, and population planning. In primary education, SAP aimed at establishing 55,000 primary schools, mainly for females, over a period of five years so that 6.46 million new seats could be added to raise the participation rate of girls in education from 53% to 82% by 1998. Responsibility for the implementation of SAP was given to the provincial governments, with the involvement of the community, NGOs and the private sector.

The eighth FYP (1992-1997) was launched in 1993 while the political game of musical chairs was being played in Pakistan. Reviewing past performance the FYP stated that,

> The National Educational Policies and Five Year plans of Pakistan have emphasized universalization of primary education at the earliest possible, improving the relevance of curricula, reforming the examination system...and enhancing the quality of education in general. Despite substantial growth in the number of educational institutions, the desired goals could only be partly achieved...a large number of educational institutions were started without proper infrastructure. The condition of the existing educational infrastructure has deteriorated and dilapidated in the absence of proper maintenance. About 35,000

> primary schools are with out shelter...a large number of schools lack essential facilities such as latrines (toilets), potable water, teaching aids etc. The standard of our education is far from satisfactory. The curricula lack relevance. Methodologies of instruction and testing are outmoded. There are gender and rural-urban imbalances both in availability and quality of educational facilities. The dropout and failure rates, particularly at the terminal levels, continue to be quite high (GoP, 1993).

The eighth plan set targets and goals that ricocheted off previous goals. For example, it aimed to achieve universalization of primary education through providing education facilities at a reachable distance for every boy and girl in the relevant age group, improving facilities in primary schools, and providing a primary school for settlement of 300 persons or more and a mosque school for every settlement of less than 300 people. By passing legislation making it obligatory for public and private housing schemes to provide land for primary institutions free of cost, the goal was to enroll an additional 5.5 million additional primary school children, and raise the percentage of primary female participation from 53.7 to 81.6 percent and that of male children from 84.8% to 95.5%. Needless to say the educational goals set by the eighth plan could not be achieved; the reasons were complex but not very different from other historical and political experiences of Pakistan.

Benazir Bhutto became the first woman prime minister of a Muslim state. This fact, along with her high sounding rhetoric about strengthening foreign relations, protecting minority rights, increasing provincial autonomy, improving education and national health policy, enhancing rights for women, etc., led to great expectations from her.

Unfortunately, much of Benazir's rhetoric did not translate into action. As a matter of fact her first term as prime minister led towards such ethnic conflict and governmental instability that she lost much of her political support within the first few months of holding office. In February 1990, *Mutahida Qaumi Movement* (MQM) directed a strike while rioting in Karachi forced Benazir to call in the army to restore order. In addition to the violence in Sindh and a budget deficit, there were increasing charges of corruption pointed not only at her close allies, but also to Benazir, her husband[37] Asif Ali Zardari, and her father-in-law. Internationally, Pakistan faced heightened tensions with India over Kashmir.

The tussle between Benazir and Nawaz Sharif led to opposing views and interpretations of constitutional authority. For example, the relationship between centre and provinces, especially Punjab and Baluchistan (although never cordial) became overtly antagonistic during Benazir's rule. Both the Benazir and Sharif governments were dissolved twice (each) on charges of corruption, maladministration, nepotism and use of political violence. It is difficult to distinguish which was worse. On the one hand Benazir's government was responsible for setting up the controversial Placement Bureau which made political appointments to the civil bureaucracy[38], while on the other hand Mian Nawaz Sharif was responsible for setting up special courts, which were actually established to benefit his allies and supporters and ultimately proved to be a humiliating scar on the face of justice in Pakistan. If Benazir's government was implicated in

[37] Benazir has been charged with laundering state-owned money in Swiss banks through bogus companies. She is currently on trial by a Swiss court. Her husband, Asif Ali Zardari has been alleged to have stolen hundreds of millions of dollars by demanding 'commissions' on all types of government contracts and other dealings.

[38] These bureaus were later abolished.

extrajudicial killings in Karachi, Nawaz Sharif's government showed no respect for the judiciary and engineered dismissal of the Chief Justice[39].

Both Benazir and Sharif promoted partisan interests and politics. Each government launched a one-sided, anti-corruption campaign to target opposition politicians and critics of the regime. The national press was restricted in its critique of the ruling government and indeed in both Benazir's and Sharif's terms there were incidences of arrests and beating of prominent journalists. The purpose of the above discussion is to argue that during this period the priority of the successive governments was political survival. Educational policy-making in this context was left to the bureaucracy with little if any input from the political leadership. It is important to note moreover that the Pakistani bureaucracy is not molded on the pattern of a Weberian bureaucracy. Yet, over the span of time since 1947, it has become a player in itself with major stakes in the political system. Thus, educational policy-making is not carried out in a professional, detached manner as is perhaps the case in South Korea where educational continuance committees carry out their work of overseeing continuity in educational policy-making despite changes in the political landscape and leadership of the country (UNESCO, 2005).

Educational policy making and planning in the current period (since 1999)

The ninth FYP (1998-2003) was introduced in 1998, during the second political term of Mian Nawaz Sharif. Himself an industrialist, Nawaz Sharif and his family had cultivated close relationships with big businesses abroad and had a clear penchant for business-friendly policies. His educational vision also had a clear bent in this direction.

[39] Mian Nawaz Sharif took Chief Justice Sajjad Ali Shah's order of releasing some civil servants who were arrested by order of the Prime Minister personally and started a long tussle and attacks on the Supreme Court. In this personal war against the Chief Justice he succeeded in dividing the judges into two camps

The Ninth FYP prepared under his watch, leaned clearly in favor of the market as a mechanism for allocation of resources for education and social services in Pakistan. It amalgamated the transfer of investment from the public to the private sector and was based on a neo-liberal philosophy of liberalization, privatization, and deregulation. In terms of planning for the educational future and social development of Pakistan, the ninth plan relied heavily on NGOs and the private sector to achieve social development and educational goals, especially those related to introducing technology into the public education system.

The Ninth FYP outlook was inspired by the global rise of neo-liberal ideology and was easily accepted by the general public in Pakistan due to common disappointment with the repeated failures of previous educational policies and planning. Under the ninth plan the social action program (SAP-II) is supposed to continue along the same lines as SAP-I, with minor changes based on experience and lessons learned in the past during the implementation of SAP-1. Reviewing past educational performance, the ninth plan states:

> In 1996-97, out of total 19.22 million primary school age (5-9 years) population, only 13.72 million were in school and 5.5 million were left out, who were never enrolled. The gross participation rate (1996-97) was 46% (male 56% and female 35%). At present, the total number of primary schools in the public sector is about 145 thousands, including about 37,000 mosque schools. One third of primary schools are female schools. In addition, 7,177 Non-Formal Basic Education Schools are run by the Prime Minister's Literacy Commission. About 30% schools are underutilized. More over, there are a considerable number of ghost schools across the country (GOP, 1998a).

The ninth plan mentions problems like financial constraints, shortage of physical facilities and equipment, untrained teachers, teacher absenteeism and lack of commitment, a 45% dropout rate at the primary level, weak instructional supervision, and harsh and uncongenial teaching methods.

In addition to declaring its intention to improve the quality of elementary education and meet physical targets, the ninth plan listed some of its major objectives and initiatives as follows: establishment of a National Technical Education Council and encouragement of investment in education from local and foreign sources; encouragement of students to specialize in a specific trade through industrial units; compulsory teaching of Nazira *Quran* from Class-I and *Quranic* translation from Class –IV; Islamiat to be made compulsory from Class-I to the BA/B.Sc. level; increasing the education budget from the existing 2.2% of GNP to 4% by 2003; introduction of mobile library services for semi-urban and remote areas and introduction of a comprehensive library and information services policy through legislation.

It was hoped that these initiatives would result in integrating primary and middle level education into elementary education (I-VIII). It was also hoped that these efforts would enhance gross participation rate at the primary level from the existing 71% to 90% by the year 2002-3 and 100% by 2010, thus resulting in increasing participation rates at the middle level from 46% to 65% by 2002-3 and 85% by 2010. there was also the hope that such policy initiatives would enhance retention and completion of the primary education cycle for up to 90% of students (both boys and girls) by the year 2010, thus ensuring achievement of a minimum level of learning, up to 90% primary education

students by the year 2010 and expand and strengthen the base for secondary education thereby reducing the existing disparities to half by the year 2010.

The government of Pakistan once again changed on October 12, 1999 after a bloodless *coup d'état* in which General Musharraf overthrew the Sharif government and became *de facto* head of government (Chief Executive) of Pakistan. Initially Musharraf's *coup d'état* was rather welcomed by a general public that was thoroughly disappointed and disgruntled by the corrupt and inept governments of Benazir Bhutto and Nawaz Sharif.

However, since taking up office, Musharraf has experienced a steep decline in his approval rating as a result of a number of factors. Corruption and economic ills continue to plague Pakistan, despite the strong rhetoric of Musharraf and his handpicked Prime Minister, Shaukat Aziz[40]. Musharraf's decision to continue with both the roles of President and military head has made his role as the President of Pakistan very controversial. Also, the Musharraf government has become very unpopular domestically due to its foreign policy of pro-American stance[41]. Internationally he supports the US led war on Iraq, nationally his speeches on national television express a view that he 'had no choice' but to act in unison with the United States. These factors, along with the fact that his rule is becoming increasingly dictatorial[42] supplemented by Musharraf's policy of

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[40] Musharraf announced well before election, that Shaukat Aziz would be the next Prime Minister

[41] Musharraf ordered launching a major military offensive in the tribal region of WANA, with out any concern for tribal citizens of Pakistan. Many innocent resident families were displaced and injured in the hunt for terrorists. This has caused a national insurgency movement made up residents of WANA whose homes were demolished by their own army in its heavy bombing campaign. Decisions like these have given a political chance to some right-wing Islamic fundamentalist parties in Pakistan who were never popular in the past.

[42] Musharraf had leading Supreme Court Justice Taqi Usmani, suspended from the Supreme Court. Other Justices of the Supreme Court were also removed from office for refusing to declare Musharraf's continued one man rule. Constitutional laws have been passed that allow Extraordinary Immunity to the President and his family and the armed forces while senior opposition MPs have been jailed and continue to

'having his cake and eating it too' has led to a steep decline in his popularity. For example, he projects himself as a moderate leader, yet when it comes to controversial issues such as honor killings, he relents to the demands and pressures of the religious right and patriarchal society. His position on rape victims (Washington Post Online), for instance is a clear example of his tendency to appease fundamentalist forces in the country. Despite growing unpopularity at home, Musharraf continues to enjoy support from foreign leaders. So far there have been three assassination attempts on General Musharraf and the situation has reached a point where his mobility to move within Pakistan is severely restricted due to security reasons.

To improve the state of education, the Musharraf government came up with an Action Plan termed 'Education Sector Reform Action Plan (ESRAP 2001-05) in 2001 (GoP, 2001a). The Education Sector Reform's (ESR) objectives contained in the ESRAP 2001-05 document may be delineated as follows:

- Universalization of primary education and adult literacy;
- Mainstreaming *madaris* for diversifying employment opportunities for their graduates;
- Improvement in the quality of education through better teachers, upgraded training options, curriculum and textbook reforms, and a competency based examination system;
- Introducing a third stream of gender and area specific technical and vocational education at the secondary level with innovative approaches for counseling students; and

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be held in prison for expressing views which were critical of the army's role. The Musharraf government also shut down opposition newspapers and exiled their editors, as happened with the editor of the Balochistan Post

- Setting up monotechnics/polytechnics at the District and Tehsil levels. (Social Development in Pakistan, annual review 2003. p.95)

ESRAP serves as an umbrella under which different national policies and international commitments towards improving educational and human development are being carried out. Various programmes and projects initiated as a result of the National Education Policies of 1992 and 1998-2010, along with the National Plan of Action on Education For All (EFA) and Social Action Program (SAP-II), fall under ESRAP. The current education policy has been based on the agreed themes and strategies of the Social Action Program (SAP-II), such as improving quality, expanding access for out-of-school children (especially disadvantaged groups), improving management and supervisory services, capacity building, institutional development and financial sustainability. It has a heavy focus on primary education.

Currently Pakistan's educational policy aims at compulsory primary education, (100% percent by 2010), retention/completion of the primary education cycle up to 90 percent of students (both boys and girls) by the year 2010 and achievement of a minimum level of learning by 90 percent of primary class students by the year 2010.

It is important to mention that ESRAP is a fundamental precondition for Pakistan to receive concessional lending from the World Bank and the IMF.

A few examples of past failed national educational/literacy initiatives

A complete and comprehensive list of all the failed educational projects would be too long to discuss here. In the following space I provide a few examples of a number of initiatives that were launched in order to enhance national literacy and levels of education in Pakistan. A common theme amongst all program and projects is that all the above

initiatives were planned and implemented in an ad hoc manner without much concern for their effectiveness. These initiatives, as I show below, started and suddenly shelved at the behest of the policy-makers with a remarkable suddenness.

Village Agricultural & Industrial Development (V-AID)

The V-AID programme was initiated in 1953. It was sponsored by UNESCO and the government of Pakistan. The emphasis was on community development. About 8,000 village literacy centers were organized by the late fifties the programme lost its focus, and was dropped altogether in 1961.

Pilot projects under Basic Democracies, 1964-69

During the rule of Ayub Khan a study group was set-up to prepare pilot projects on literacy in 1964. Union councils in rural areas and town committees in urban areas were allowed to organize literacy centers; however the programme ended within five years.

Peoples Works Programme, 1973 (Sipah-e-Khidmat)

This project was based on voluntary initiative, unemployed educated youth, rural development workers, school teachers and other volunteers were engaged to teach illiterates. This project was discontinued even before it completed its 1st phase in 1974.

Television for education: Television Literacy Programs 1975

In 1975-81 the Pakistan Television Corporation launched a package of 156 tele-lessons targeted to provide literacy to adults and youth who could not attend formal schools. These tele-lessons included 10 lessons on teacher training, 78 lessons on reading and numeracy, and 68 lessons for post-literacy. Community viewing centers were established with the involvement of NGOs. This programme apparently succeeded in making 1091000 youth and adults literate over a course of six cycles (Ghafoor, 1994).

1986-89 Drop-in-schools plan

As a follow up to the failed National Literacy plan a new program called "Drop-in-schools" was approved in 1986. The rationale of the project was articulated in following terms:

> In the past, no less than three educational policies had been formulated to universalize primary education but none of those could materialize...if the Drop-in school system succeeds, nearly 100% universal primary education may be achieved in a short time without incurring any capital expenditure on infrastructure and equipment (GoP, 1986b).

1986-1990 Nationwide Literacy Program

The new civilian government of Mohammad Khan Jonejo shelved the Drop-in schools scheme within a few months of its launching and replaced it by the Nationwide Literacy Programme. The program lamented the previous policies when it stated:

> The achievement in increasing the literacy rate is...far less than the stipulated rate of 48%...Thus the National Literacy Corps of educated people will be formed to increase the literacy rate up to 53.53% in the period of four years and six months up to June, 1990 (GoP, 1986c).

1986-90 Nai Roshni Schools

The Nationwide Literacy Program was replaced by the *Nai Roshni* (New Light) Schools. This program was launched in 1987 and was initiated by Prime Minister Muhammad Khan Junejo who took office on March 23, 1985 under Zia. It was justified on the following grounds:

> At present the Literacy activity is being staged...This programme at its preliminary evaluation has not shown any worthwhile results. There are very little prospects of improvement because the very concept/approach lacks rational...The prime minister of Pakistan in his five point manifesto has committed to the nation to raise the literacy percentage to 50%. This calls for planning on a larger scale to cover the segment of society whose responses to education are more likely to be positive and whose coverage will yield rewarding results (GoP, 1986a).

The *Nai Roshni* schools were also sought to give a second chance to primary school dropouts. This programme aimed to open 22,000 *Nai Roshni* schools over 3 cycles of two years each. The aim was to provide basic education to children who could not attend regular schools. However, the *Nai Roshni* scheme also failed to produce the desired results.

Given the current state of education and literacy in Pakistan, there is no doubt that the educational planning and policy making has not been on the right track. While each successive policy (and policy-maker) has blamed the last policy (and its policy-makers), no real effort went into examining the causes of failure; so little effort in fact that as many as nine policies and nine FYP failed to achieve their aims.

The important question that arises is: why despite various attempts to bring changes in terms of redistribution of educational opportunities has policy making and planning failed again and again? More than half a century after the creation of Pakistan, the state of education can only be described as dismal. A study conducted by Oxfam International stated that by the year 2005 Pakistan alone would account for 40 percent of the region's children out of school, compared to 27 percent in 1995. (Oxfam, 2002).

Many scholars (Ahsan, 2003, Ghafoor, 1994, Qaisarani and Khawaja 1989) have given different reasons for the policy failure. These include: limitations of financial resources, poor appreciation of educational priorities, inadequate delivery system, population pressure, poor policy making, lack of implementation, lack of political will, corruption, etc., as major hurdles in educational goals. Writing in the broad context of development Mahbub-ul-Haq (Haq, 1976) succinctly enumerated seven sins of development planners in Pakistan. His analysis is as relevant today as it was almost 3 decades ago. Haq's list of the blunders that the development planners in Pakistan have committed includes, policy makers' fascination with numbers and measurability; imposition of bureaucratic controls; addiction to development fashions; divorce between planning and implementation; neglect of human resources; preoccupation with investment levels and mesmerization by high growth rates in the GNP term's and an ability to forget the real objectives of development (Haq, 1976). To illustrate the above in Pakistan's educational context, Haq writes, "schools and hospitals were often built without adequate provision of teachers and doctors to staff them...shiny new industrial units were often added to the ones already lying underutilized. More schools were built each year while the requests of the existing ones for adequate current expenditure to run them properly were rejected" (p.18).

One of the reasons for the failure of the policy is that the policy makers in Pakistan have always articulated education in isolation from the social and political factors that affect it. More often than not education has been equated with schooling, without linking it to broader issues of knowledge construction, knowledge production and knowledge consumption. The only exception to this trend so far has been the launching of SAP in

1992. This, along with the fact that education is seen by policy-makers and society at large in terms of the 'economic wealth it can generate' may explain the successive educational policy failures for Pakistan.

Another reason for the repeated failure of Pakistani educational planning efforts lies in society's particular conception and philosophical understanding of the meaning of education, which is in turn defined by educational ends. How a society is hegemonized into believing and accepting the particular role education should play can only be understood by studying the particular socio-historical, cultural and political experiences of that society. In Pakistan's case, the colonial legacy, lack of an industrial base, bureaucratic and military meddling in politics along with an enduring feudal culture, provide important insights into why providing 'skills for the market' is seen as the primary role of education. The dominant view in Pakistan is that the primary function of education is economic advancement. Educational policy and plans have repeatedly centered on the need for literacy and education that can prepare the population to contribute to the national economy. Ever since 1947, policy after policy has reiterated this aim.

After independence Pakistan continued with the British model of education, which was based on psychological indoctrination that encouraged the elite to absorb the values and notions conducive to the British as colonizers of India. Such a model had no concern for social or human development or for democratic citizenship. As a matter of fact, democratic citizenship or critical questioning was something that was purposefully avoided in the British-designed curriculum and methods of teaching in India. (For a detailed account of education under colonial rule see, Chakrabarti 2000, Said, 1993, also

see Macaulay Thomas (on-line) for articulation of Colonial Britain's Educational Policy in India).

At the time of independence, the meaning and purpose of education in Pakistan was not redefined. Nationalism and religion were added into the curriculum along with artificially hyped views of Pakistani/Muslim history, with little attempt made to distinguish myth from fact. Though British rule had been challenged, the model of education designed by the British was not. In fact the British model of education continues in Pakistan even today, albeit with minor changes. When the dominant discourse on education in Pakistan is juxtaposed with the power struggle of various autocratic civilian and military coups, it becomes clear that it is not a coincidence that such a competitive concept of education based on market principles and rightist ideologies, which rationalize the rule of bureaucratic, oligarchic and militaristic regimes, has been supported by successive Pakistani governments and is reflected in policies and planning for educational issues.

Another factor in the dominant discourse of education for economic activity can be linked with the absolute lack of an industrial base at the time of independence and the government's narrow focus in addressing that particular problem through economic and educational policies. The above-mentioned factors are internal to Pakistan's socio-political and historical experience. External factors, like the dominant development discourse in the 1940s and 1950s that viewed development as economic development and made no distinction between human and economic development or between growth and development, assisted in promoting the paradigm of education for economic activity.

However, purely economic motivations behind education fail to address the human development needs of the masses and speak only to a specific class, thus ignoring the interests of the majority of Pakistanis. As Aronowitz (1998) argues, "an education that defines a person's values in terms of wealth and power and sees schooling as a ticket to a place in the corporate system misses the mark of being truly humanizing" (p.4).

Sharp swings in focus and methods have been witnessed after each policy failure. For example, the seventh FYP (1988-93) categorically rejected non-formal education as a method of imparting education and improving literacy in the country, whereas the 1992 Education Policy resurrected non-formal education, especially for adult literacy, and the 1998 Education Policy virtually condemned formal education and called for non-formal approaches to providing primary education.

Another noticeable trend is that, as repression increased with increasing non-democratic practices in the country's political sphere, the educational policy and planning documents started using more flowery and clichéd language and schemes and educational plans that claimed to change the fate of the nation over night. For example, despite the seventh FYP's failure to provide a school for every child within a radius of 1.5 kilometers and open a mosque school for communities smaller than 500 people, the eighth plan goes on to commit to open mosque schools for communities smaller than 300, though a distance of 1.5 kilometers gets translated into 'reachable' distance, which is a pretty vague term.

Another trend is complete lack of accountability as each successive plan criticizes the last plan and then goes on to make grandiose plans without any real effort to remedy the ills that it points out. At best these plans have been attempts at reformation without any

structural change whatsoever. At worst these can be termed as the political rhetoric of largely unrepresentative regimes and highly politicized bureaucracies. Each new policy plan caught up on the new buzzwords in the global educational discourse and tried to implement these without any consideration of their suitability and/or adequacy for Pakistani socio-cultural milieu. A recent (and glaring) example of this continuing tendency is the emphasis on ICTs as the panacea for all education problems of Pakistan.

To this I now turn in the next chapter.

CHAPTER 6

EDUCATIONAL TECHNOLOGY IN PAKISTAN'S PUBLIC SCHOOL SYSTEM

INTRODUCTION

Analyzing qualitative data is indeed a daunting task. As I explain in my chapter on methodology, I went to the field with post-positivist orientations, what Denzin and Lincoln call the seventh moment of qualitative research. Thus, I did not go there with a set of hypotheses that I was to prove (or disprove) later. My purpose was to examine educational technology policy in Pakistan in terms of its articulation, implementation and reception by the stakeholders in the realm of education. The fact is that I, the researcher was the measurement tool, while the narratives of my research participants (co-researchers), situated in the local contexts, were my validation tools. I used the voices of the stakeholders to measure the success and/or failure of educational technology policy rather than subscribing to the conventional methods that rely on measuring through aggregates and averages. In this sense both data gathering and analysis were ongoing processes, each informing the other.

During my fieldwork, it was pretty apparent that the way computers have been introduced in the educational system of Pakistan was fraught with pitfalls. Despite the fact that not much time had lapsed since the inception of this policy, almost all groups of stakeholders (parents, teachers, school administrators and students) had come to realize that this, like other policy initiatives in the educational realm, was an ill conceived, ill planned and a haphazard effort. The experiences of respondents as expressed in their narratives and voices, furnished clear evidence that the promise of educational

technology in terms of the creation of locally relevant knowledge, the creation of knowledge communities and networks, the easing of the financial burden, and the use of online resources for educational purposes, etc., was not being fully realized. It was in light of this narrative data that I chose to analyze two projects that had been initiated to place computers in the public schools in Pakistan as representative cases of the introduction of educational technology in Pakistan.

Pakistan is in the early stages of introducing computers into its public schools. In line with its current information technology (IT) policy, the government of Pakistan has launched various schemes to promote the use of computers in public schools. Some of the projects have been started as pilot projects that may or may not continue, depending on the success/failure of the project or on the availability of funds from governmental and international aid agencies. Other projects have been started under different policy initiatives, such as those of the federal Ministry of Science and Technology (MOST) and the federal and provincial ministries of education. In this chapter, I examine some of these projects and initiatives in order to answer the questions I raised earlier, such as: How is educational technology policy being articulated at different levels? How is such policy being implemented? How do various stakeholders perceive the introduction of technology and its role in education? How does this policy affect issues related to teacher training, teaching methods, learning, curriculum integration, and evaluation? To this end I selected two projects that are most directly related to the introduction of technology in educational settings. The first project, entitled 'Establishment of Computer Labs in Secondary Schools in Punjab' (ECLSSP hereafter) was launched as a pilot-project by the Federal Ministry of Science and Technology (MOST). It is a federal initiative that seeks

to introduce computers and related education at the provincial level in the province of Punjab. The second project, known as 'Up-Gradation of Schools through Community Participation Project' (CPP hereafter) was launched by the Education Department of the Government of the Punjab and is a purely provincial initiative.

Project A: Establishment of Computer Labs in Secondary Schools in Punjab (ECLSSP)

Brief Background of ECLSSP

ECLSSP, started as a pilot project in a limited number of schools identified for the establishment of computer labs. However, the plan envisaged that the number of schools would increase as the project developed. Initially, 54 schools from all 34 districts of the province of Punjab were identified for participation in the pilot project. Each school was to be provided with 15 Pentium-III computers and one printer. These machines were to be equipped with modems connected and configured to a Local Area Network (LAN) environment in a peer-to-peer network arrangement. The only software that was supposed to accompany the computers was Microsoft Windows XP operating system with Office XP as the application software. A private sector distributor was chosen to provide services associated with software-related problems for a period of one year. The contract to provide furniture for the computer laboratories was handed out to another private sector party.

A time line for the completion of the pilot project was set at 8-12 months. The project was not included in the incumbent five-year plan and so it was financed out of the block allocation for development of IT. The cost of the project was estimated at Rs. 39.240 million (approximately CAD 1 million at 2004 conversion rates). The project planners

started out with the assumption that each of the schools chosen for the project would be able to provide a room that could be converted into a computer lab. Thus, the project only provided the above-mentioned equipment and furniture and not the infrastructure. The project did include on-site training of five teachers in each of the selected schools, but the training of teachers was left to the supplier of the computer hardware, a private distributor with no expertise in the educational sector or in teacher training. The project also proposed to hire an IT instructor for each of the schools for a period of one year at a salary of Rs. 5500 per month (approximately CAD 140 at 2004 conversion rates). MOST committed to provide the salary for the IT teachers for the first year and the cost was included in the project. However, the hiring of IT teachers was later dropped at the request of the Government of the Punjab. The funds allocated for teachers' salaries were instead directed to The University of Education (a different Directorate of Staff Development in Punjab for general teacher training). The decision not to hire the IT teachers caused substantial change in the scope of the initial plan and caused many problems that I mention below in detail. The annual recurring expenditure to continue the ECLSSP project was estimated at around Rs. 4.104 million and the provincial and district governments were to take over the project after the first year.

It is quite apparent that the major focus of the project plan was the provision of computer hardware. Little attention went into how this hardware was to be used as a tool to create knowledge in the classrooms, or how the teachers would be trained; the appropriateness and adequacy of the software that accompanied the computers for the needs of the learning communities where they were being introduced. The ECLSSP project design was clearly influenced by two sets of factors. First, the global

instrumentalist discourse on the introduction of computers in educational institutions was clearly at play in the articulation of the rationale for the introduction of computer technology in educational settings in Pakistan. This discourse articulates technology as the panacea for educational problems and sees hardware provision and connectivity as the most important issues in the introduction of educational technology in classrooms. The discourse however ignores several important issues, such as access, equity, quality and knowledge creation which, should be central to educational planning in general but especially in developing countries. Furthermore, the global discourse on technology in education looks at the issue as a pre-requisite to an effective and 'productive' educational system that has the capacity to catapult developing countries into an advanced stage of development. What is neglected in this discourse is the cultural, social and economic context of the educational sector in the developing countries. It is also silent on issues of criticality in the context of technology in education.

The second factor that influenced ECLSSP project was the ad-hocism that has been the hallmark of educational policy-making in Pakistan. An additional factor that seems to have influenced the planning process in this respect is the feeling among Pakistani policy-makers that Pakistan has been left off the information bandwagon, especially as compared to its archrival, India. As I argue later these influences left the project inadequate in addressing the issues that have plagued Pakistan's education system for many years and that the project set out to redress. I also argue that this could have been avoided by situating computers (and technology) within the socio-political, cultural and economic context of Pakistan.

Lack of expertise in the planning bodies

Let me start with the legacy of ineffective educational policy-making in Pakistan in order to put the analysis of the ECLSSP project in perspective. To begin with, the Ministry of Education did not conceive the ECLSSP. The sponsoring agency of the ECLSSP project was instead the Federal Ministry of Science and Technology (MOST). The sponsoring ministry left the execution of the project to National Telecommunication Corporation (NTC), the Punjab Information Technology Board (PITB), and the provincial and the district governments in the province of Punjab.

To say the least, the first two executing bodies, namely the NTC and the PITB, had neither the mandate for nor expertise in educational policy-making. To take one example, a serving officer of the Pakistan Air Force on deputation with the NTC formulated the project. While the said gentleman had training in computer science, he did not have training in dealing with the educational or the pedagogical issues related to the introduction of technology in educational settings. During my conversations/interviews with him it became apparent that his mind-set was clearly influenced by the global technology-in-education discourse. Responding to questions about the specific aims and goals he said, "putting computers in classrooms will enhance IT knowledge among students and this knowledge is extremely important as Pakistan has been left far behind in the field of IT in this global age of knowledge economy" (interview). When asked about his vision of the relationship between education and technology or precisely what role technology can play in knowledge construction, learning, teaching, etc., he did not have much to say. Similarly, when I asked where he sees the project five years from now, he did not appear to have a long-term vision.

Like the NTC, the second executing body, the PITB also lacked (and still lacks) expertise in pedagogical issues, especially at the school level. As a matter of fact PITB has become quite controversial, as it has increasingly been operating in areas that are beyond its mandate. PITB was set up in 1998 initially as a consultative body for providing input into issues related to information technology, especially the development of software companies. However, over the years PITB has been venturing more into the educational realm and has taken up a number of educational roles without having the necessary expertise, infrastructure and/or monitoring/evaluation machinery. For example, the PITB initially assumed the role of an education board to impart professional education and training in IT, sponsoring Java, Oracle and other IT-related short courses. In doing so the PITB not only duplicated what was already being done by the private sector without any government investment, but it also became a competitor with private parties. In 2001, the PITB also assumed the role of controlling and imparting Inter-Computer Science (ICS) education at the college level, and started publishing and printing textbooks in IT education. Finally, the authority to approve private entrepreneurs to start Intermediate in Computer Science (ICS) education (in over 300 colleges in Punjab) under the public/private partnership was shifted from the education department to the PITB.

Having neither the expertise nor the infrastructure necessary to support educational planning, monitoring and evaluation tasks, the PITB suspended many of its ongoing projects and awarded contracts to new entrepreneurs. Most of the contracts of existing entrepreneurs were not renewed. All this has led to many protests and complaints about the PITB's abilities to deal with educational issues. Yet despite protests and past failures,

PITB was once again nominated to execute the ECLSSP project. The fact that the federal government chose two agencies for the execution of an educational project who neither had the experience or expertise to deal with issues related to education nor the use of technology for educational purposes became a major cause of resentment on the part of provincial and district educational departments. During interviews I was told that neither provincial nor district authorities were given any 'say' in project design. The provincial educational authorities clearly told me that their role in the project implementation was 'token representation'. Thus, the new project started with tension and a clear lack of enthusiasm on the part of the provincial and district governments and other stakeholders.

Rhetorical articulation

In my opinion, assigning educational tasks to agencies that clearly lack educational and pedagogical expertise is a clear indication that there exists a problem of articulation and that the policy-makers do not clearly distinguish between information technology, technical education and educational technology, three broadly interrelated but essentially different areas. The failure to make this important distinction leads to a number of tensions and complications that are evident in the ECLSSP project design. As I show later in the chapter, the rhetoric used in the project design implies technological determinism, i.e., a technology-led theory of social change where technology is seen as the main force in moving society forward. For example, the goals for launching the pilot project state:

> Government of Pakistan is making maximum effort to promote information technology education desired areas in the country. The need of the hour is to introduce I.T at grassroot level i.e. to students of schools. The distribution of PCs

> in the secondary schools will be a major contribution in familiarizing students with basic computer knowledge and its operation. The computer laboratory in the schools would also act as a community center for general public in the evening. (GoP, 2002c)

In outlining the objectives of the project, similar rhetoric is used:

> The National IT Policy aims at promoting information technology education at all levels of social sector. This project is planned to provide low cost computers to schools in order to introduce the students with computer technology. Distribution of low cost computers to secondary schools would assist in teaching computer subjects at school level resulting in our generation blessed with basic knowledge of Information technology (GoP, 2002c).

Such a techno-centric view is precisely what critical pedagogists warn educators to be cautious about. They argue that such an emphasis on hardware sidetracks the main issues related to education in general and pedagogical practices in particular. Critical theorists of educational technology also inform us that the implication that computers will lead towards a generation blessed with knowledge of Information Technology, presupposes a number of factors. First, that technical knowledge is the most important knowledge. Second, that technical development is the prime cause of change (good) in society. Third, that technology is the fundamental condition underlying the pattern of social organization. Fourth, that human factors and social arrangements (i.e., issues related with teaching methods, hierarchy, curriculum relevance, etc.) are secondary to technology. Such a preoccupation with technology itself rather than with the role it has to play in education is also evident in the project design. It is especially evident in the project goals.

This leads to non-translatability of goals for the administrators, teachers or anyone involved in monitoring and/or evaluating the project.

It is interesting to note the rhetorical articulation of the project. For example, phrases such as 'maximum effort to promote information technology', 'need of the hour', 'grassroot level', 'computer knowledge', and 'community centers' reflect the influence of the global rhetoric about the importance of IT echoed in the language used in project design.

As I mention in chapter two, the global success of information and communication technologies in the business world has led to a major paradigm shift in the way of thinking about education. The global idiom is clearly reflected in the ECLSSP rhetoric, which in turn creates pressures and conditions that result in a situation where computers are projected as a major tool for instruction and a symbol of quality education within the classroom. However, as critical theorists of educational technology –such as Tyack & Cuban (1995) and Cuban (1986, 2001) – argue such projections are quite detached from social reality.

Influence of the global discourse on computers-in-education

Further analysis of project design and the rhetoric used also reveals a strong neo-liberal orientation/bias which portrays economic globalization as unstoppable and technology as apolitical or neutral. Like the neo-liberal discourse, the project language obscures the political nature of technology and hides the differences of interest and power. It does so by blurring the distinction between distinct domains such as 'information technology', 'technical knowledge', 'knowledge', 'education', and

'educational technology' and by failing to address issues of power related to the schooling experiences of students.

The project design also provides a good example of wider political discourse about education. The dominant discourse in Pakistan articulates an urgent need to introduce technology without relevance to the social conditions where it is to be introduced. Some schools selected for the ECLSSP project did not even have access to a phone line or a room that could be converted into a computer laboratory. Critical pedagogists like Apple, Postman, and McLaren point out that politicians arguing for the widespread use of computers in the classroom should be seen as a result of a desire to avoid any accountability regarding the economy and deteriorating conditions in the standard of living. In the last decade, the gap between rich and poor has increased tenfold in Pakistan. There are huge urban-rural, public-private and gender disparities in the educational system. A project that does not address such issues may well be accused of avoiding and side tracking the main issues by pre-occupying the public with technology and suggesting that it is a solution to all problems. Furthermore, as critical pedagogists have argued, projects or educational reforms that insist on widespread use of computers without contextualizing related pedagogical issues or planning structural changes that are required for the optimal use of educational technology may indeed be seen as complicit in the desire of the business world to control education.

At this juncture, it becomes important to have a look at the push factors, i.e., where is the push to introduce new changes coming from? I have mentioned the global discourse about the role of technology in education and the neo-liberal agenda that looks at education as a vast market that can be exploited for profit. However, I argue that such

factors alone are not the only ones driving the Pakistani government towards introducing technology in classrooms. I argue that one also needs to take into account the internal or domestic push factors. This is where critical literature contributes to the study of schooling and use of educational technology by emphasizing the socio-historical and political aspects associated with education and schooling.

Domestic discourse on computers-in-education

In Pakistan's case, the push factors are multi-layered and complex. As mentioned earlier, competition/comparison with India has been one of the major push factors for the introduction of computers in Pakistan's public education system. An interesting observation that came from talking to a number of people in policy-making positions was the Indo-centric vision of the policy-makers. It is no secret that Pakistan's foreign and defense policies have always been Indo-centric. India also features in a large way in the domestic political discourse as well as in the articulation of nationalism and citizenship in school texts in Pakistan (Naseem, 2004). Thus, it comes as no surprise that the motivations behind 'getting wired' and 'catching up' with the technological bandwagon are also driven in part by rivalry with India. In a number of instances, it was commonplace to hear the lament that India has pulled ahead in the field of technology and that Pakistan must catch up. Similarly, talk of the success of neighboring India, China or the "Asian tigers" abound in conversations as it does in the print media in Pakistan.

Another important push factor, behind the introduction of technology in the public educational realm is provided by the need to secure loans and aid from international agencies. The role of donor agencies like the World Bank and the IMF in this respect

cannot be ignored. Pakistan has a long history of relying on aid money. It is no secret that international aid always comes with strings attached. In fact, a certain level of connectivity is a prerequisite for securing some concessional loans for the education sector. Thus, one major factor pushing Pakistan's government to introduce computers in education is to please the donor agencies. For example, in ECLSSP, notions such as 'grassroot' and 'community' reflect a desire to impress donor agencies, as these elements are likewise stressed by most donor agencies. However, as one goes on to study the project design or implementation strategies these notions are never operationalized.

Scholars like Shore (2005) and Potter (2000) analyze the external push factors working on developing countries in terms of 'colonizing imperatives' or 'asymmetrical dependency'. Since the majority of projects started because of external stimuli (push factors), they tend to ignore local contexts and needs and therefore end up in failure. Often enough, rather than resulting in development that could lead to empowerment, these externally stimulated initiatives lead to a greater rich/poor, North/South divide and result in accumulating debt for the nations that implement them.

As mentioned above there is major confusion over the way in which notions such as 'IT', 'technical knowledge/education' and 'educational technology' are understood and used by the policy-makers. For example the 'objectives' statement of the ECLSSP project tends to refer to 'low cost computers as tools' by implying that computers will lead to knowledge creation. By this definition, computers are understood to be a part of educational technology and as distinct from information technology. However, a project that is designed to introduce computers to be used as educational technology needs to elaborate on issues of teacher training, curriculum integration, age appropriate

educational software, language issues, etc. The project design does nothing to address any of such issues.

Theorists like Means, Penuel and Padilla (2001) have argued that mere purchase of equipment and installation of cables cannot make any difference in student performance. The actual factors that bring about any positive change are in fact good leadership and skilled teaching rather than computers. In the ECLSSP project design it is presumed that putting computers in classrooms will automatically translate into the development of a 'generation blessed with basic knowledge of Information Technology'.

'Knowledge of Information Technology' is a very broad term and needs to be defined in a clear and precise manner. Information technology can mean different things to different people. The manner in which it is used in project design tends to confuse it with 'technical knowledge'. Use of words like 'generation blessed with knowledge information technology' is a clear evidence of borrowed enthusiasm from techno-advocates. Such statements echo similar views held by many in the developed countries who view technology as neutral and thus capable of providing the basis for an educational renaissance that will create a generation of problem-solvers well prepared for the information age. However, as pedagogists researching issues related to the educational utilization of technology argue, after decades of spending billions of dollars there is still no conclusive evidence in the developed world that the desired educational renaissance has been achieved.

Problems related to hiring/training of teachers

Flaws and contradictions inherent in the ECLSSP project became apparent once the implementation began. To take one example, there were problems related to the vague

hiring jurisdictions especially in terms of hiring teachers who can teach IT-related curriculum. Teachers could not be hired as the provincial government was not ready to commit a budget to hire 54 IT teachers for any length of time beyond the initial year (for which the federal government had promised the salaries). This refusal by the provincial government was as much because of the lack of clear jurisdiction as it was a result of grievance due to the token representation it had been accorded in the policy-making process and the perceived lack of provincial autonomy. There is no doubt that provinces show no ownership of such projects. However, the refusal to hire IT teachers should also be seen in terms of a lack of clear understanding about the aims and objectives of launching a new pilot project that was expected to expand from the provincial to the national level. The project clearly failed to define specific goals for introducing computers in schools that might have highlighted the need to hire IT teachers. The provincial government's refusal to hire IT teachers clearly undermined the whole project. My interviews with school administrators and teachers reveal frustration with not being able to deal with the machines delivered to them. At the same time, lack of trained teachers for the use of expensive IT equipment in many cases results in the loss of precious and scarce resources that could have been spent on other much needed amenities or education development programs. The provincial government justified its refusal to support teachers' hiring on the grounds that:

> the syllabus, approved by Punjab Text Book Board for class 9, 10 shows that the high tech IT teacher is not required for teaching computer to matric students of the Project Schools. Rather the existing teachers can better handle the task, in case adequate training is provided to them in IT (GoPb, 2002d).

Problems related to school selection criteria

Thus, not only was the hiring of new IT teachers shot down, but a casual attitude towards teaching with computers left the whole issue of teacher training pending.

Furthermore, the project design did not lay down specific criteria for the selection of schools that were to be equipped with computers. During interviews with heads of schools selected for participation in the project, it became apparent that the management of a number of schools was not even made aware that their institution had been selected for the pilot project. Interviews with district authorities revealed that the district authority had identified schools at random as they were not given enough time to coordinate with the participating schools.

Such lack of coordination and communication was evident at almost every stage of the project's implementation. Lack of foresight about potential problems was also evident. For example, the computers supplied by the private vendor came with a limited one-year warranty. The time line for completion of the pilot project was also one year. Thus there were concerns that by the time some schools received their equipment, the warranty would have already expired. In separate interviews two teachers confirmed that they had received faulty equipment about which they could not do anything since the warranty had already expired by the time it arrived. Other problems, such as non-delivery of equipment, or not having the infra-structure to support computers, etc., were also reported by the teachers and staff at the participating schools. I have grouped such problems under specific categories and will discuss them together with the problems faced by the second project that I studied. Let me now turn to a brief description of the second project which was conceived by the provincial government of the province of Punjab and implemented at the district level.

Project 'B': Up-Gradation of Schools through the Community Participation Project (CPP)

The second project entitled "Community Participation Project" (CPP) that I studied differed from the ECLSSP project on a number of accounts. First, the CPP is purely a provincial initiative of the Punjab Provincial Government, whereas the ECLSSP Project was conceived at the federal level and then handed down to the province. Second, the finances to implement the CCP were earmarked in the five-year plan and World Bank's structural adjustment credit whereas funds for ECLSSP project were made available as a one time block allocation for 'Development of Information Technology'. Third, while the ECLSSP project was designed especially around IT education, the CPP project aimed at a general up grading of schools and education. As such the project has much wider scope as it aims to address a large number of aspects related to pedagogical practices rather than computers alone. However, introduction of computers in classrooms was one of the central components of the CPP Project.

Brief Background of CPP

Let me briefly describe the background of the CPP before examining the educational technology-related aspects of the project. I must, however, mention that both projects that I studied show a lot of common problems that I have grouped together in specific categories. I discuss them later in the chapter.

The CPP Project started under the auspices of the Punjab Education Sector Reform Programme (PESRP), a part of the Education Sector Reforms Action Plan (ESRAP) that was established to carry out Education Sector Reform (ESR, discussed in chapter five) in Pakistan. A policy document of the Punjab Education Sector Reform Programme (PESRP) described the context of the project in the following terms:

> The foremost problem, diagnosed now by all concerned is that of low participation rate, high drop out rate and low learning achievement. We also recognize the inadequacy of the linkages between education and the demands of the job market...we are also faced with issue of equity, which in fact means making education available to each citizen according to his [sic] intellectual capability. Furthermore, there are concerns regarding gender issues having come to realize that no country can develop without developing its female work force...the government of Punjab recognizes the importance of education for economic growth and social harmony...it further recognizes that to improve the education indicators, reforms at all level of education-elementary, secondary and higher education was necessary (GoPb, 2003b).

The primary focus of the PESRAP is on areas such as improvements in access and equity, enhancing the quality of education, support to public-private partnerships, improvement of monitoring and evaluation, introduction of technology in education and increase in public financing of education. A number of projects and programs have been initiated under PESRP. These include: Adopt a School Program, the Community Participation Project (CPP) for school up-gradation in afternoon shifts from primary to middle and middle to secondary and higher secondary levels, as well as access to public funds (25% utilization of funds) at district level through Citizen Community Boards (CCBs) and Parent Teacher Associations (PTAs). The community participation project (CPP) is one of the mainstays of the PESRAP. The policy document by the Government of the Punjab describes the rationale behind the project thus:

> it will be interesting to note that if 100% boys and girls of relevant school age group are to be accommodated in middle and high classes and only about 50% in Higher Secondary Schools, the Punjab Govt. would require to spend approximately Rs. 80 billion, whereas the budget of school and higher education is Rs. 30,100.21 million (development and non-development budget). Keeping in view the present financial constraints of Punjab Government, it is almost impossible to allocate such huge amount to open new institutions as per the number required. At the same time, we can't afford to let our youth roam aimlessly in the streets. We must have a plan to accommodate such boys and girls in existing educational institutions (GoPb, 2001b).

The rationale presented to the Punjab Cabinet to get project approval, stated that:

> The proposal has been generated by the fact that private sector is playing an increasing role in the provision of school education while Government has been unable to meet the growing demand because of resource and management constraints... (GoPb 2001b).

According to a central Government of the Punjab's document: a 'community Model School' will be an improved from of 'private Schools System' with the cooperation and supervision of the Govt. (GoPb n.d.). Under this project the Government of Punjab provides public school buildings and leases them rent-free for a period of five years to independent entities, who could be any private party, nongovernmental organization (NGO) or individual. Private parties run the leased government premises schools as private schools in the afternoon, leaving them to function as public schools in the morning. Private parties who lease school building for the afternoon session are expected

to pay the bill/fines/penalties in respect of all utilities of both the morning public school and afternoon private school. In addition, they are obliged to establish computer labs (according to government specifications) and call the afternoon school a 'community school'.

The afternoon school also has to provide computer education to the morning session if the latter does not offer computer classes under any other program. The provision, maintenance/ damage/ loss, etc., of computers is the responsibility of the private administration. However, the afternoon community school administration can hire its own janitor or guard who is also expected to look after the equipment during morning school hours. Coming to the technology dimension of the project, according to the Education Department of the Government of Punjab, 468 computer laboratories have been established in high schools under the CPP scheme in various districts of the province. The government has set an upper limit of Rs. 65, in addition to the regular fee of Rs. 200, to provide computer education to secondary grades (6-10) and Rs. 300 to higher secondary grades (11-12) and ICS students. The profits made by the afternoon community schools are shared with the government at a ratio of 90:10 respectively. These schools are supposed to have separate school councils and management. According to the CPP contract document issued by the government of the Punjab, there is no interference from the morning administration in the running of afternoon schools. My research however indicates the presence of numerous problems arising out of tensions, conflicts and lack of coordination and cooperation between morning and afternoon administrations.

To avoid double shifting of morning school (a program that had been introduced in the past and failed miserably), afternoon schools can only offer a different level of schooling, for example, a primary school can be run as a middle or secondary school in the afternoon session. The timings are adjusted in such a manner that the afternoon school starts half an hour after the morning school finishes. The private party responsible for setting up an 'Afternoon Community Model School' has the power and discretion to hire and fire teachers and negotiate their salaries. At the same time, the payment of teachers' salaries and collection of fees, etc., also falls under the private party's mandate. However, the Government of Punjab has fixed an upper limit for the fee that the private administration can charge. Private parties cannot exceed that upper limit when setting their fee structure.

The private parties running the afternoon community schools are expected to upgrade schools by taking on responsibilities like whitewashing the school premises, repairing and adding of new furniture, ensuring office maintenance, establishing a library if the school does not have one, providing computer and science laboratory if the morning school does not have one, hiring computer teachers to offer computer classes both in the morning and afternoon sessions if the morning school does not already provide one, providing coolers for drinking water and building washrooms if they are not already available and paying the utility bills. The Punjab education department in turn provides a number of facilities to private parties to deliver better education. For example, it furnishes a school building, including library and science lab, if the school has one, free affiliation with The Board of Secondary Education (BSEs) for a period of five years, a teacher-training program for afternoon school teachers, and licenses to hire the services

of employees of the morning school when required by private administration through mutual consent. An additional Monitoring and Evaluation Cell has been established for a period of one year in the Department of Education by the Government of Punjab to monitor and evaluate the program.

The scope of the CPP is quite large, as it deals with a variety of issues concerned with educational reform starting from structural upgrading to improvement of access and quality in education. The government is promoting the introduction of computers as a major component of providing access and quality to the general public. Out of a total of 6890 schools upgraded under CPP, 468 had already established computer laboratories in various districts of Punjab at the time I was conducting my field research.

Problems faced by the CPP

Time span of the project

The CPP is experiencing a lot of problems; for one thing, using primary school buildings for secondary schools in itself generates problems, as senior classes usually require laboratories and libraries, etc. – facilities that are not readily available in primary schools. Private administrations need to build these facilities from scratch. However, they may not be inclined to do so since the schools' lease is only for a five year term.

This brings me to the second problem faced by the CPP schools, i.e., a five year contract is not a big enough incentive for most private parties to invest heavily in infrastructure like the construction of new labs. Thus, any upgrading is likely to be superficial and is unlikely to enhance the quality of education in any major way. As one teacher that I interviewed pointed out, "a fresh coat of paint on the wall or a couple of computers has little to do with long term commitment and the kind of resources needed to actually improve the quality of education" (interview).

Corruption

For some reason the government expects very altruistic behavior from private investors, the majority of whom have come in to make a profit and have no expertise in pedagogical issues. Profit motivation in a system that is deficient in monitoring services and that itself shows signs of corruption, can hardly be expected to work for the benefit of public education. During my fieldwork I was told that some private investors had used bribes to grab some very good urban school buildings and that they were using them for purposes other than running a community school. To take one example, a private contractor used one public school building as a marriage hall. In another instance, afternoon administration was accused of building residential housing on the school premises. The case was under investigation at the time I was conducting my field work.

Fees

Investors from the private sector have exploited loopholes in the contract document itself. For example, although the government has set an upper limit on fees for computer classes, article number 4 in the contract between the government and private party reads, "where nursery or an early childhood education programme and computer classes are established there will be subject to some user charges based on the ability to pay by the local students in consultation with EDO" (GoPb, 2001c). I was told by parents of the students that afternoon schools were charging much higher fees than prescribed by the Government of Pakistan. This problem had arisen as private investors read "ability to pay by local students" very differently than the government. This has led many to charge much higher fees than those set by the authorities. My interviews with parents revealed their dissatisfaction with the quality of education being provided and the amount of the fee being charged.

Teaching materials

Neither Pakistani national curricula nor any policy documents contain any detailed guidelines or software requirements for teaching and learning of either a specific subject or different subjects. Policy documents only specify what hardware and software should be available in the labs, but are completely silent on how it is to be used by teachers and students. In other words, the use of technology has not been linked with educational objectives. Computers are being taught as an isolated subject and teaching materials designed with a focus on drill and practice exercises. The private administration of community schools is allowed to supplement the syllabus prescribed by the Government of the Punjab with a syllabus of its own choice. I studied two different afternoon schools operating under the CPP. Both had a different set of add-on teaching materials in addition to the government prescribed curriculum. However, in both the cases I noticed that the supplementary curricula were similar to the government-prescribed techno-centric curriculum. During interview sessions with the heads of schools and teachers, I asked about the rationale behind supplementing prescribed curriculum with other books. I was interested to find out if such decisions were based on identification of what was lacking in the government-prescribed curriculum. I also wanted to find out if there was a philosophy/understanding at work for introducing additional curricular sources such as what Pakistani children should learn, how the learning should take place etc,. However, I found out that much of the added curriculum was written by local authors highly inspired by Western sources which had no relevance for Pakistani students. One of the teachers I interviewed pointed to a small essay in a grade 9 computer science practical notebook entitled 'Promise of Bluebirds', which talks about 'severe wintry garb', 'vigil', 'coal

miners', '25 cents' etc. "Students are not familiar with such terms and although the exercise has nothing to do with text it is about copying text and graphics and other items to the clip board. I believe if it was a story with which students could relate to they might have become more interested in reading it." (interview).

Adding extra resources, has however, created confusion among parents, who see no point in buying additional books. One parent said that, "the administration is making money from books also ...they take a cut from the vendors because we (parents) are always asked to buy books from particular vendors or the school administration directly" (interview).

Both projects confirm Armstrong and Casement's (1998) observation that most of the critical questions that should precede a passionate rush into introducing technology in education not only have not been answered but also have not even been asked. The quality of education does not automatically improve by introducing computers into the classroom. The use of educational technology requires teacher training and accountability, curriculum reform and integration, reeducation of bureaucratic involvement followed by decentralization, and support from school administration.

Educational Technology in CPP Schools

Let me now turn to specific details related to the use of computers as per the Government of Punjab's (GoPb hereafter) requirements in the CPP. The Punjab, Department of Education has provided specific guidelines regarding the hardware and software the private afternoon school administration is expected to provide when establishing computer labs. For example, private afternoon administration is expected to provide a Pentium 1 or equivalent 233 MHz computers with 64 MB RAM, 10 GB hard

Disk, a standard SVGA monitor, 1.44 MB Floppy Drive and 52xCD ROM. The GoPb has also provided guidelines in terms of the number of students per computer. For example, the guidelines mandate one computer for every ten students. In addition to having at least 5 connected computers in each computer lab, afternoon administration is also expected to provide one laser printer, one dot matrix printer and networking facility.

My examination of the CPP reveals that, while the details concerning hardware have been provided in considerable detail and clarity to the private administrations of the afternoon community schools, the project document is rather silent on a number of other important issues that directly affect the use of computers in education. The emphasis on hardware demonstrates focus on form rather than content. Such emphasis stresses the importance of 'particular skills' over actual learning. This was also confirmed by my observations in the field and by the respondents that I interviewed. Most of the teachers that I talked to were of the opinion that the decision of putting computers in the classrooms was made without properly studying the educational dynamics of Pakistani society. I was also told that at no stage in the project design or even during implementation were teachers or principals consulted. My interviews and conversations with teachers revealed that they had not received any training and that they had no idea as to what the project envisaged or what kind of learning should take place in the computer-equipped classrooms.

Too much emphasis on hardware is not unique to Pakistan's case. As Hawkins & Macmillan (1993) argue, huge budgets for computer hardware are not matched by an investment in training teachers to take full advantage of the educational potential offered by technology. Policy makers in Pakistan demonstrate similar tendencies where the major focus and attention is directed towards acquisition and provision of computer hardware.

The attitude of policy makers, bureaucrats and administrators is very causal with regard to other factors, such as the professional development of teachers, curriculum design and integration, adaptability of software etc. Such factors play an important role in the utilization of technology for both enhancing learning and reforming education. It is somehow assumed that putting computers in the classroom will automatically result in knowledge generation and learning.

The importance of teachers' training cannot be emphasized enough. A number of experts, such as Bruder (1993), Roblyer, Edwards & Havriluk (1997), and Siegel (1995), among others, have argued that well-trained teachers make the difference between the success or failure of the meaningful integration of technology and curricular practices. A myopic focus in capital investments alone with no attention paid to investment in intellectual capital (demonstrated in both the projects that I studied) has the potential to lead to a total waste of already scarce resources spent on equipping schools with technology. Ideally speaking, it is the curricular needs that should dictate the use of particular technology rather than technology directing classroom practices. However, both projects that I examined fall short on this front.

Both projects tend to treat the introduction of technology as an independent factor. In actuality, any meaningful utilization of educational technology depends upon a variety of complementary technologies and capabilities, for example: bandwidth, electricity, teachers' ability to use computers for pedagogical purposes, curriculum integration, the number of computers available per student, the number of hours each student gets to work on a computer, etc.

Edwards (2002) points out that information technology is a general-purpose technology, and that its impact depends on the level of other complementary factors. If the cost of complementary investments and reforms are not included in the budget, investments in information technology can, in some countries, end up having negative social productivity. I stated earlier that the ECLSSP assigns Rs.1000 per school per year as annual recurring cost. This amount is unrealistically low for it fails to take into account complimentary recurring expenses. Similarly, complimentary expenses earmarked for teacher training, etc., are also extremely low.

Despite being a part of the larger well-intentioned educational reform package, the CPP suffers from some inherent problems that are primarily a result of inadequate educational vision. As a result there is no clear vision of how technology can be used to address problems of education in Pakistan and how it can be used to address issues of quality in education.

A reading of the project documents confirms that the primary focus of the 'computer science' component of the CPP is to provide familiarity with computer hardware to the students. However, ironically, the level at which the project planners mandate it to begin is in grades 9 and 10 (in the morning sessions) and grades 11 and 12 (in the afternoon sessions). A logical question that arises is: Why is it imperative to start at grade 9 and not earlier? Similarly, for the evening shift, what is the rationale for introducing computers in grades 11 and 12? It became clear during my interviews with the project planner and other educational bureaucrats that two factors are at play in such decision making. The first of these is the fact that technology, especially computer technology, is largely perceived by decision makers not as a means of producing indigenous knowledge (or

science, if I may say so), bur rather as a means of training a workforce that can be used to carry out tasks of processing raw data (primarily from the West) into finished products (software) that can be resold to developing countries for exorbitant prices after being packaged in the West. I call this the software face of neo-imperialism. This also confirmed my earlier observation about the techno-centric obsession of policy makers.

The second factor affecting decision-making is that computers are perceived as a subject to be taught or as a skill to be inculcated rather than as a tool that can facilitate knowledge production. Thus, we see the emphasis mainly on learning how to operate computers rather than on 'using' computers. This was confirmed by teachers as well as students that I interviewed. At least three teachers from the CCP project were graduates from private computer [43]colleges. These teachers have been trained in the basic operation of the computer and partly in computer languages that are no longer used or taught in computer programming anywhere in the world[44].

These teachers told me that they have been hired by private contractors to teach the basic operation of computers to students of grade 6-12 in morning and afternoon schools. When asked if they thought that such instruction was enough they were unanimous in their opinion that all such instruction would teach students is, " how to operate computers, not how to benefit from them" (field notes). One instructor reminisced that when he enrolled for his computer course, he and his lower middle class family thought that this education would take him places. In his own words "we thought once I completed the course I will instantly get a job and maybe even be able to go to America

[43] These for profit computer colleges have mushroomed in Pakistan in the last ten years. Often enough they offer certificate level courses in computer science. Such private schools have high staff turn over so they often hire their own graduates to teach future classes.

[44] The last time there was a demand of such languages was the Y2K crisis at the turn of the century when the computer programs written in 1960s-1980s needed to be attended to.

one day. My family spent the hard earned money to put me in the private computer college but once I graduated all I could get was this contracted job" (interview).

Furthermore, "I could have learnt most of the skills if I had just sat at the computer and played with it for a few months. The programming they taught us is so out of date that it can't get me a job even in Pakistan" (interview). When asked what he would do if given a chance to go through school all over again, he replied, "I was good at geography throughout my school years. Now that I think had they used computers to teach us geography it would have been so much better. I could have become a good geologist. Now I often go to web sites related to geography, learning is so much easier this way. However, my limited English sometimes hampers my understanding. I also don't understand some concepts and I wish there was someone to guide me" (interview).

He further informed me that, since 'his' school has dial-up internet access, he tries to teach the students by 'taking them' to websites on subjects that interest them after the computer class if there is time, "otherwise all they do is chatting and looking at un-Islamic pictures" (interview).

When I asked the students if they felt that the computer education was helping them, their initial response had a hint of pride in it. Asif (pseudonym) told me, "I am the only one in my family who 'knows' computers. My father is happy to pay the extra money. He says 'knowing computers will increase my job prospects. One day I will get an office job and maybe I can go to Dubai or America....who knows" (interview). Another student, Mazhar (pseudonym), was proud that he could operate a computer. "I can operate [a] computer. It is so good. I tell my brother and my sister. I am also best in video games" (interview). However when I asked them to show me all they could do with the

computers it was apparent that they could only open applications such as MS Word. When asked if they write their assignments using computers their response was negative. "Our exams are always handwritten" one of them told me. Another said, "We are 65 boys in the class. How can we all type our exams on 5 computers? In any case our exams have to be answered on the sheets provided by the school". Yet another student pointed out that the printer had been out of paper and the ink "for many, many months". In another CPP afternoon school the printer had broke-down during the first few months after its installation and the school (read: private contractor) never had it repaired.

In response to my queries about the use of the internet, most of the students stated that they knew how to "open" Explorer (Microsoft Browser). Based on my conversations with the teachers and the students of the CPP schools in respect to the use and educational utility of the internet, three sets of problems became apparent. One, the teachers are not fully trained to guide the students as to what materials to look up on the internet and where. Two, since most of the content on the internet is in English there is hesitation among the teachers and students to venture beyond a certain point due to their limited knowledge of the language. Three, a techno-centric curriculum, teacher-centered teaching practices and an examination system based on evaluating students on memorizing abilities have all failed to motivate teachers or students to expand their knowledge beyond rote learning and take advantage of the immense information available through the World Wide Web.

Analysis of the two projects

My research and interviews with various personnel and stakeholders from both projects highlight a number of problems that I have discussed in detail in this section. As

these problems were more or less common to both projects I discuss them in an aggregate manner and group them together under common themes.

Problems related to ambiguous articulation of educational change

My research shows there is a lack of consensus among policy-makers regarding the use of computers in classrooms. This problem is indicative of among other things, a lack of clear understanding of the ends of education and, by extension, to the goals that are set for educational change. As Fullan (1982) argues, a critical factor in the successful implementation of a project is consensus on the meaning of planned change. In Pakistan, there is no shared vision between educational policy-makers at the federal, provincial, district and school levels regarding the meaning of what counts as the direction of educational change or the relationship between education and social change. At each level, use of technology in education is defined differently. In other words, those responsible for the implementation of computers in classrooms do not agree either on the purpose or on the appropriateness of technology for educational use.

At the policy level, computers/technology is defined in terms of 'educational tools' that can enhance learning (GoP, 1998). This articulation is translated into inculcating technical skills for the future economic growth of the country (ECLSSP is a good example of such an articulation). The provincial policy-makers on the other hand understand technology to be part of a larger reform that aims to address the issues of access (and to a very limited extent the quality of education). Thus, introduction of computers at the provincial level is largely being treated as a part of infrastructural improvement to schools and as an indirect contribution to improvement of access and quality of education.

What seems to be missing in such an articulation is a 'vision' that technology can be used as an educational tool to enhance learning and create knowledge that corresponds to the current needs of Pakistani society (read: low social and human development). However, envisioning technology as a learning tool requires looking at technology beyond the mere importation of hardware and software, infrastructural upgrading, or an item of prestige. It requires that policy makers, decision makers and pedagogists first define the goals of education in accordance with particular local and global needs, and then connect the defined goals of education with the use of a particular technology in classrooms. It also requires close attention to important issues such as proper teacher training, curriculum integration, and equity and access, as these issues affect the use of technology as educational tools and play an important role in the use of technology as a tool to enhance learning and knowledge. Interviews with school principals and teachers informed me that, unlike the policy-makers, there is an implicit understanding on the part of some teachers and principals that technology has the potential to be used as an educational tool. For example, one of the teachers, in response to the question: "In what ways are computers being used in the classrooms currently and what can be alternative possibilities to using computers?" said that, "Instead of using computers just for teaching technical computer skills for example the kind of 'Algorithm' exercises we give to our students, if we ask students to look for correct spellings or find meanings to different words or learn about geography. I think this can really engage a greater number of students especially the younger ones" (interview). However, principals of CPP schools told me that the district authorities have challenged such a vision as it neither conforms to

the guidelines provided by the textbook board nor to the vision of district and provincial authorities.

In their report on OECD (Organization of Economic Co-operation and Development) countries, Venezky and Davis (2002) remark on a similar lack of consensus between teachers' interests in teaching with technology, and the inability of national curriculum and examinations to accommodate the teachers' vision in the early stages of introducing computers in education. In Pakistan's case, I believe, such a situation can be attributed to an impulsive and unreflective desire on the part of decision makers to jump onto the technology bandwagon without contextualizing the educational needs and priorities of Pakistani society. One principal who I interviewed summed up the situation in the following terms:

> Pakistani educational policy-making demonstrates a history of following foreign trends without rationalizing their use in the context of Pakistan's educational needs. I believe putting computers in the schools should also be seen in that light. Otherwise who in their right mind will talk about putting computers in the schools in a country where 20% schools are without buildings and more than 50% without a boundary wall? (interview)

Both projects that I examined show weak program designs along with lack of management and governance that are essential for sustaining the projects in the future. My interviews with principals, teachers and parents reveal that most stakeholders are skeptical about the government's commitment to implementing key elements of other sub-programs that are directly linked to the success or failure of introducing technology in schools. For example, the majority of the teachers that I interviewed were not satisfied

with the type and duration of training that has been offered by the government. Most of them cited this as an example of lack of commitment on the part of the government.

Lack of federal-provincial policy coordination

Any effective educational policy requires a vision. The development of a vision requires a clear-cut understanding of a particular society's local needs and its position in the global context. It should be based on trying to predict the unpredictable future by making probable projections based on increased communications and rapid globalization. An educational vision should ideally be based on both short term and long term goals. It should aim at dealing with immediate needs and demands both local and global. An educational vision also requires a broad consensus on what society deems as valuable knowledge; what kind of knowledge a society wants to impart to its young; and how such knowledge will be imparted and who will impart it. Unfortunately, Pakistani policy-makers lack a clear vision of what should be counted as education. This lack of vision is clearly reflected in the planning on introducing computers in educational institutions in Pakistan.

Both projects clearly lack a well-defined vision that could be translated into goals for the introduction of computers into schools. Clarity of goals and aims could help in laying down the criteria for site selection, staff recruitment, and designing curriculum and teaching methods to use computers as learning tools. There is a serious lack of understanding about the role the newly introduced computers are to play in education at all levels (administrative, teaching, curriculum etc). One of the reasons, as I explained in the previous chapter, is the political instability in the country that has existed almost since its inception as a nation-state in 1947. Another factor that plays a major role in this

respect is the rapid turnover of administrators and bureaucrats in the educational sector. Political intervention and the resultant rapid, indiscriminate and disruptive transfers of many sincere and competent bureaucrats working in the education sector has jeopardized and weakened the institutional capacity of educational departments in Pakistan. Most of the senior and middle level bureaucrats who are appointed to the ministries of education at the federal and provincial levels are those who have fallen from the favor of the ruling clique of the time. One example is the low social status attached to education in Pakistan, so that even the politicians and bureaucrats despise the Education Portfolios. In fact the Education Portfolios are used by the political leadership of the country as punitive measures. Any politician or bureaucrat who falls from grace is transferred to the Educational Bureaucracy at various levels. A common expression used in Pakistan for a bureaucrat's transfer into the ministry of education is "*khooday line*" (rough translation: dead end). Thus it comes as no surprise that as soon as a bureaucrat gets his/her transfer letter to the Ministry or Department of Education, all strings are pulled and all contacts exploited to secure a more prestigious appointment. Thus, bureaucrats in the Ministry of Education view themselves (and are viewed by others) as holding a job-in-transition. This has psychological consequences, not the least of which is a lack of interest in the work. As a result, no long term vision is put forth or articulated. This results in a lack of continuity in educational policy making. The resultant ad hocism is also apparent in the policy on the introduction of technology in education along a number of dimensions.

The case of the ECLSSP shows ideal characteristics of educational projects conceived and planned without a clear vision. This project was planned at the federal level and then passed down to the provincial authorities. My interviews with provincial authorities

reveal that they were not willing to own the project in which they had no input. As a matter of fact one bureaucrat told me that the project (ECLSSP) has an uncertain future. He went on to say that, "it is unfortunate as good deal of money that could have been utilized in other areas for educational development had been already spent on the project" (interview).

An analysis of the first project shows that disagreements between federal and provincial authorities can be traced to the 'lack of clarity in the objectives of policy'. For example, the provincial government did not agree with the federal government on two very important issues of teacher training and hiring additional teachers for computer classes. The bickering between the federal and the provincial authorities mainly ensued over the financing of the teachers training, not on the modalities of *how* and in *what* they were to be trained. Reasons given by the provincial government were once again articulated on the basis of economic reasoning rather than the logic of knowledge creation. During my interviews with various officials related to the two projects it became clear that economic determinism and not the quality or ends of education were the central issue that occupied them. In other words if a project is not quantitatively feasible, i.e., more students that can be translated into statistics and shown as a proof of improvement to federal government and donor agencies, there was no need to spend money on improving the teaching faculty.

Often enough the decision makers at both the federal and the provincial levels also justified non-investment in teacher training on the grounds of 'absenteeism'. In interviews with the federal and provincial authorities I was told that, "public school teachers spend less than 30% of time in classroom teaching than what is required". This

seems to be an issue that has caught the fancy of the public and the popular press. There is a lot of public debate on the issue of absenteeism or 'ghost teachers' and 'ghost schools' (i.e. teachers and schools that exist only on paper while continuing to draw salaries). In reviewing the local press, I found this issue raised repeatedly. There is no doubt that it is indeed a real and important issue. However, while more attention is paid by the press and the authorities to the problem of absenteeism, what seems to have gone unnoticed is the problem of what I call 'presenteeism', i.e., when teachers show up for work in body but not in spirit. Presenteeism relates directly to the problem of low morale and self-esteem among the teachers. My interviews with teachers confirmed that the problem is widespread.

Teacher training was largely seen as a waste of time and resources on teachers who in any case were not spending the required time in the classroom. Thus, the solution for policy makers seems easy: instead of training teachers to be more professional, elevating their morale or adding incentives, it is better not to waste any more resources on teacher training. Thus, policy-making encounters the problem of 'absenteeism' by making policies that complement what is left of the public education system with 'presenteeism'. In short, the dominant view regarding teachers is that they are incompetent and disinterested and are there because they could not find any other jobs. The policy-makers deal with the above issues by excluding teachers from perks and privileges available to other public servants.

When policy-makers refuse to train teachers or invest in their professional development on the grounds that it amounts to a waste of resources, they fail to realize that cycle has to be broken somewhere and teacher training may be a good starting point

for restoring prestige to an age-old formerly respected profession. As for the teachers, such is the extent of low morale that one teacher told me, "we are at the bottom of a very hierarchical structure, we have no say in decision making, and we are never consulted on any issue regarding teaching, schooling or curriculum. Every time anything goes wrong fingers are pointed on us. Socially speaking teaching has no prestige attached to it in Pakistan. The pay is low resulting in low social prestige". A male teacher quipped; "If you are a male school teacher no girl wants to marry you. I simply fail to understand how some one can expect us to take pride in what we do; honestly I will be out of this system the day I get a chance"(public school teacher from the ECLSSP). Another teacher told me that, "The current bribe rate is Rs. 100,000 to get a teaching job...once you secure a job either through bribe or '*Sifarsh*' (contacts) your posting, promotion or transfer is not based on merit. Nothing is based on merit" (interview).

A complex mix of problems, like corruption, nepotism, political interference in appointments of teachers, etc., along with factors like salary levels having no reference to the rapidly rising cost of living, low social prestige, etc., have led to a situation where the teachers are at the lowest ebb of their morale. As a matter of fact teaching does not attract the young and motivated any more. It is now a commonly held view in Pakistan that public school teaching is a 'dead end or blind pit'. As a result, only those who can't find any other jobs end up choosing to teach in public schools.

It is thus not surprising that in the CPP, where schools are being run by private parties, the issue of teacher training remains at the forefront. Although all four schools I visited in this category had part time IT teachers who had diplomas or certificates from local computer schools, none of the teachers had any formal teacher training. When asked

how computers could improve or enhance learning, a teacher from the CPP responded by saying: "Technology has nothing to do with good learning; good learning requires discipline and a respectful attitude". When I probed further as to why computers were being introduced in classes and why so much money was being spent on putting computers in the classrooms if technology had nothing to do with education, most teachers responded by saying that it was the current fad and they did not see this practice as taking root in the public system. "If it were a well intentioned and a well-thought-out policy then training teachers who could use computers to teach different subjects would have been the top priority of the government", another teacher told me (interview).

Gap between policy and practice

There also seems to be a contradiction between the actual practice of the provincial government and the goals and objectives as stated in the policy. For example, the National Educational Policy 1998-2010 clearly states in its objectives that it aims:

1. to modernize education in Pakistan via the application of information technology al all levels;
2. to emphasize the different roles of computers as a learning tool in the classroom;
3. to popularize information technology among children of all ages and prepare them for the next century (GoP, 1998 pp. 88-90).

However, my interviews and field research show that the provincial and district authorities have taken steps that actually contradict the goals and objectives stated by the said policy. To begin with, in the light of the above objectives it is clear that any aim of modernizing education via information technology requires the curriculum to be

expanded beyond the narrow skills-based syllabus that is currently being used. Second, using the computer as a learning tool demands teacher training and the need to incorporate technology across different subjects rather than teaching it as just one optional subject.

In the ECLSSP one of the reasons put forth by the provincial government for opposing the hiring of IT teachers was that "qualified IT teachers are not available on contract on provision of Rs. 5500/month beyond big cities". It is interesting to note that the Punjab government almost simultaneously started the CPP, where private parties are expected to overcome this problem. This gives the impression that either the provincial government is not interested in the project started by the federal government or that facts on the ground have been twisted to suit whatever point the provincial government wants to make. After all what is a major concern for one project should also be considered as such for another project.

Most importantly, the principals of CPP schools mentioned that they were being penalized for introducing computers to classes younger than grades 9and 10. One of the principals told me:

> My school is currently facing fines for teaching computers to level 6-8. Can you believe that we have been issued a notice by the district authorities that it is not legal to teach computers to students other than 9, 10? (interview)

Another CPP school principal told me that:

> The relationship between private and public can never become a partnership until private parties are given some representation in the decision making process. So far the whole CPP is based on decisions made by government and private parties

have no say in the delivery of education. This is very frustrating for those of us who see room for improvement but can do nothing about it due to red tape (interview).

I confirmed the above statement with one of the district authorities and was told that:

> There are many related issues which the private afternoon school administrators don't understand; in any case, the Punjab Text Book Board has only approved a syllabus for classes 9 and 10 so how can the schools teach younger classes (interview).

The district authorities were also clearly frustrated with the way the CPP was being run and felt that the schools under the project were violating the authority of the provincial and district authorities. As one district administrator pointed out,

> It seems each school is defining its own agenda. Some schools have already started computer classes at middle level using curricula written by private authors but not approved by Punjab Board. Such schools are charging additional computer fees to younger children. We hear complaints from parents all the time (interview).

Issues related to teacher training

One of the most important components of meaningful use of technology for educational purposes is a well trained teaching workforce. In the ECLSSP the teacher-training component was left entirely to the discretion of the computer vendor. Talking to various stakeholders revealed that the teacher training provided by the vendor did not amount to anything more than instruction on how to start and shut down the computer.

Ironically, even this basic training could not be imparted in certain cases as the schools did not have a person designated for such training.

The refusal of the provincial government either to train current teachers or hire new IT teachers actually changed the scope and focus of the project in a significant way. It is interesting to look into this issue in order to see the rationale behind the provincial government's decision to do so. The first reason given by provincial Government of Punjab was that "as the project does not provide any allocations for IT teachers beyond its completion period (the first initial year)," therefore the hiring of IT teachers should be dropped altogether. The second reason is more troublesome. Once again it was based on economic rather than educational reasoning. The government's rationale was that it is not economically viable to hire IT teachers since IT is an optional subject for grades 9 and 10. The reason given was that it will not increase the number of students in the project schools; rather, existing students will opt for computers in the place of some other optional subjects. Finally, it was pointed out that much of the budget is spent on the salary component of the administrative staff and ghost teachers. This leaves no room for any expenditure on the recruitment of teachers who can use technology or staff development. Here once again we see that educational decision-making has been subjected to quantitative and economic reasoning while ignoring the importance of proper teacher training in learning and knowledge creation through the use of educational technology.

Problems related to content

The importance of an integrated curriculum to the enhancement of higher-level thinking cannot be underestimated. Current research on the educational benefits of

technology suggests that use the use of technology as a cross-curricular tool helps to develop concept understanding and promotes active learning through problem solving.

A cross-curricular or integrated curriculum approach reflects a humanistic model of technology integration that is capable of creating knowledge relevant to the socio-cultural milieu where technology is being introduced (Leventhall *et al.*, 1993; Nicholson, 1995). However, treating technology as a separate subject as is the current practice in Pakistan reflects a techno-centric mindset, which, at best, is capable of imparting some technical skills to learners (McLaren, 2003, 1993; Postman, 1993, 1995). While these skills enhance students' chances of being employed, it does little to address the needs of human and social development.

Many developing countries, such as Cyprus and South Korea (Karagiorgi, 2000), learnt this the hard way. They started with a techno-centric introduction of technology in education, but after evaluation and research they shifted towards a more integrated approach. Even though there is enough evidence based on some excellent conceptual and empirical research that emphasizes the need to develop innovative and integrated curricula to avail the maximum potential of educational technology, the national curricula in Pakistan still treats technology as a separate subject. The narrow techno-centric curriculum is designed to impart a few basic operational skills through rote learning and drill practices. However, such skills become obsolete as hardware and software changes.

A net result of the introduction of computers in education as an optional, stand-alone subject is the perception among students and parents that it is not as important a subject to be studied and paid for. This is based on a common perception among Pakistani parents and students that compulsory subjects are more important and that they require

more time and attention. Furthermore, since this subject is not integrated into/with other subjects or the existing curriculum it is not considered as useful in helping acquire knowledge about other subjects. As one senior administrator told me, this perception has been a cause of failure of other such programs in the past. According to him:

> All previous attempts to introduce technology in Pakistani educational system have failed precisely because of the half hearted efforts made by government. Take the example of agro-technical educational scheme that was introduced in the seventies. It failed because it was not examined through the Board and was taken too casually by students, teachers and school administration. I see not much difference in agro-technical education of seventies and computer-technical education of today. (Interview)

Similarly, the principal of one CPP school was of the opinion that,

> Unless government makes using computers a required part of school experience by that I mean using computers for a number of subjects not just one optional subject I don't see computers playing any significant part in a student's learning. At the same time I also have to say I don't know how the government will be able to do that, because they have not been able to do that with their own government departments even. (Interview)

This rather casual and ad hoc attitude of the authorities towards the role of IT in education is also reflected in the ECLSSP, especially in terms of the provincial government's objection to hiring teachers. One of the objections stated by the Punjab government was, "the syllabus approved by the Punjab Text Book Board for class 9, 10 shows that the high tech IT teacher is not required for teaching computer..." Although it

can be argued that such an objection is not totally baseless, nevertheless to argue that teachers should not be trained because the curriculum is narrowly focused does not hold much water either. The government's objection can even be taken by some to suggest that a narrow curriculum is favored by provincial authorities as it absolves them of the responsibility of training teachers.

Lack of monitoring and evaluation

There is no doubt that monitoring and evaluation (M&E) has to be treated as an integral, continuous and built-in part of the planning process at all levels of educational policy-making and planning. However, my examination of the two educational technology-related projects in Pakistan shows that M&E is coordinated neither within nor between departments for policy-making in this respect. For example there is no proper liaison between the federal and provincial monitoring authorities and, as such, no uniform pattern for monitoring progress. To say the least, the current monitoring systems are conspicuous by their absence.

None of the heads of the schools, teachers or parents I interviewed were happy with the monitoring and evaluation or any kind of project support. I was told that many projects were simply 'paper' projects that never got implemented. Similarly, absenteeism and poor performance are common and go unreported. As one of the teachers said,

> What government terms as evaluation is in fact narrowly focused and strictly administrative tasks and they have nothing to do with the goals of the implemented project and every thing to do with controlling teachers (interview).

As a matter of fact, M&E are accorded such low priority that an M&E wing has only been established for a limited period of one year for the CPP. A staff of two persons, i.e.,

one project director and one assistant director, along with one steno-cum-computer operator and a driver with one vehicle consist of the total resources allocated for monitoring and evaluating 6890 CPP (so far) schools in the province of Punjab.

Pedagogical Issues

My field observations and interviews reveal that computers are being used in the educational process in a passive manner. In most of the computer classes, computers are being used mostly by teachers while students are still getting their information from lectures and texts. Such a 'banking model'[45] minimizes the potential offered by educational technology as students fail to develop a significant understanding to apply what they have learned to situations outside their texts and classrooms. Thus, such a model does nothing for the social or intellectual development of learners.

This is not to imply that basic skills are not necessary, only that mere concentration on basic skills should not be the focus or aim of using educational technology. Basic computing skills have to be embedded within more complex tasks that necessitate higher-order skills of reasoning, comprehension, word decoding, and contextual reading of materials. This can be accomplished by teaching students to use computers to generate knowledge and not only as yet another subject to study and pass.

There is also an incongruity between the societal worldview on learning and the kind of learning that takes place when using technology for educational purposes. By and large the majority of society still thinks memorization is the best way to learn. The national

[45] The idea of the banking model was presented and critiqued by Brazilian liberation theologist Paulo Freire in *Pedagogy of the Oppressed* (1970). Banking model refers to a model of education in which teachers deposit information/skills into the students. The stress is on memorization of basic facts rather than on understanding and critical thinking.

examination system in Pakistan is basically a test of good memory. Technology as an educational tool discourages rote memorization and requires knowledge creation through reflection, research, contextualization, and making connections. The essential purpose of having computer-based knowledge is jeopardized when traditional methods of learning such as rote memorization, etc., are employed instead of a more meaningful hands-on approach where students can relate to the use of computers for learning by and for themselves.

Technology can be used for educational purposes in a number of non-conventional ways; for example, there is educational software that promotes learning through games for young kids, and learning can also take place through exploration and collaboration. If technology is used in a manner that engages students it can significantly contribute to decreasing the high dropout rates that are the biggest challenge to the educational system in Pakistan at present.

Another way to promote learning is to make what is being taught relevant to the lived experiences of the target population. In developing countries, like Pakistan, which have little infrastructure to support technology especially in villages and rural areas, technology can be used to enhance skills needed according to the context of the local market requirements. Such experiments have been conducted in other developing countries and the rate of success and participation has been very encouraging. For example, in El Panecillo in Quito, the internet was used to educate young students to learn to make and improve the candles which they could sell in the local market (Fillip, 2002). Policy-makers have to be cognizant of the fact that use of technology for educational purposes and its long-term sustainability can only be assured by linking

educational technology with skills needed for local micro-level enterprises. Disadvantaged communities can see the results of educational technology and are most likely to support it as they can see it enhances the quality of their lives and of those around them. However, the model being used in Pakistan currently aims to prepare students for a global marketplace that has no relevance to most rural and disadvantaged communities.

Technology can enhance learning if the emphasis is not only on learning about technology but mainly learning through technology. In other words, by using technology as a tool to impart relevant knowledge through integrating technology across a wide range of subjects instead of treating it as a separate subject, learning can be made socially meaningful and relevant. Thus, technology can play a significant role in winning students' attention and encouraging them to acquire knowledge that can significantly improve their lives.

When I asked the IT teachers questions related to identifying the unique learning needs of the students, such as, the issues most students faced, their reading and writing abilities, their access to computers at home, etc., most teachers seemed a little surprised. I was told this is not how teaching is carried out in Pakistani public schools. The response of one of the teachers sums up the situation:

> If I was to spend time on identifying the particular needs of each student in a class of 65-70 students, when would I get time to teach? I can tell you they are all from poor backgrounds: Why else would they come to public school? Of course their needs are similar to the needs of all poor people, but what has teaching got to do with it? We can't help them even if we wanted to, they (students) don't do their

homework because their parents are illiterate or they (students) have to work in off school hours so we ask them to repeat the lessons loudly in the class; this is the extent to which a good teacher can help his students. (Interview)

Conclusions

In Pakistan the rationale behind introducing technology in education is based on 'techno-centric/skills based/economic reasoning'. Such an argument is self-defeating for a number of reasons. First, it ignores the social and political conditions of Pakistani society: the majority of the Pakistani population lives in rural areas where computer skills are not of much relevance to gaining employment. Second, such an argument tends to utilize technology for commercial and market needs rather than for educational and human development needs. Third, it treats technology in education as an add-on rather than as a catalyst for new thinking about teaching and learning. Fourth, mere emphasis on skills conceals issues of equity, access, and the lived experiences of poor and minority groups. Fifth, emphasis on utilizing technology for developing just a few technical skills does little to encourage reflection on the power issues underlying decisions by a small ruling minority (bureaucracy and military) affect the majority of the population. Therefore, such an articulation is not only blind to the exigencies of knowledge construction and production but it also ignores the broader ethical, moral, political, and historical implications, knowledge of which are essential for citizenship education, democracy social justice and equity or in other words, for the social and human development of Pakistani citizens. Research has proved that computer-based applications that encourage students to reason deeply enhance learning, whereas the use of computers

for repetitive skill practice seems actually to decrease performance rather than improve learning (Wenglinsky, 1998; Resnick, 1990).

However, the persistent definition of the role of education in merely economic terms has not only resulted in the lowering of educational standards in Pakistan. It has also contributed to a number of interrelated social, cultural and psychological dimensions that now present major barriers to Pakistan's social and human development, along with extremely low educational achievement levels. To take one example, the shame associated with public school teaching can be understood in the context of emphasis on education for the 'economic factor' alone. It is not surprising that people have internalized the importance of the economic factor. This has led to a societal and cultural lack of appreciation for any profession that does not promise wealth (either through corruption or otherwise). Low pay scales get translated into low self-esteem that in turn results in the low social status accorded to school teachers. Such low self-esteem is reflected in their complete lack of pride in the teaching profession along with a lack of devotion and commitment to teaching and learning. Throughout the interviewing process I came across apologetic explanations given by teachers for choosing teaching as a profession. Many teachers told me that their brother or sister or cousin is a bureaucrat, army officer, doctor or a banker, and that they have taken up teaching only temporarily. For example, one of the teachers I interviewed told me that, "I am waiting for my B.A result in the meantime I am also preparing for CSS exams, actually computer is really helping me in this regard" (interview).

Similarly economic reasoning also explains the rationale behind introducing technology in a narrowly defined technocratic sense rather than as part and parcel of the

production of knowledge that can improve people's lives by broadening their outlook, promoting a better understanding of local, national and global problems and encouraging citizens to take up responsibilities and actively participate in the democratic process. Skills being imparted through techno-centric curriculum have little to do with creation of the knowledge needed to solve social and human development problems that Pakistan faces today. Imparting a few technical skills that will soon become obsolete does not impart critical capabilities to Pakistani students to understand and deal with complex social realities of their own society or those of the rapidly changing, inter-connected globalized world.

Currently, teaching and learning in Pakistani schools lack the critical component and are not geared towards knowledge production that can offer a critique of social practices and possibility of transforming the social order and creating a better society. As a matter of fact the word 'critique' is used with a negative connotation in Pakistan. Most official documents are classified and made inaccessible to researchers for fear of being critiqued or criticized.

The Pakistani historian Qureshi (1989) in his comments about 'critique', writes, "In Pakistan today we have neither the freedom of inquiry nor the freedom of dissent. The cultural tradition, social structure and political system do not permit any deviations from the established path" (p. 148). Human and social development is not possible without debate about the problems confronting Pakistan. Such debate can only be started not only if teachers, administrators, policy makers and politicians confront their own bias towards critical inquiry but also actively promote critical thinking in educational institutions where teaching and learning takes place.

Different societies have different circumstances and therefore different goals for educating their young. However, there are some universal goals such as respect for law, respect for diversity, respect for human life, responsibilities of good citizenship, respect for democracy, etc., that all educational systems aim for. Educational technology can offer opportunities for communication, dialogue, audiovisual aids, diverse and unlimited resources and can therefore be used as a great resource for educational purposes. However, an educational system where technology's only use is to produce better technicians severely limits the use and scope of the pedagogical potential that technology has to offer. If students are not taught with an aim of learning how to learn they will not be able to keep up with the fast changes in technology. Given that technology becomes obsolete fast the technical skills imparted to the technicians if not continuously updated will put them out of market after a certain time.

It is not only hardware that is needed, but also a commitment to life long up-grading and the import of hard-and software from those countries that produce it. Such a commitment can be very pricey for many developing countries if they are not producing their own hardware and software. Even in cases where hardware and software can be produced locally, only a certain number of technicians can benefit directly, but all societies need good citizens. Thus, it makes sense to utilize technology in education for creation of knowledge that leads to an equitable and just society. In this sense, technology's purpose in education is different than its use in the business world and it is important that policy-makers and educational planners are aware of the differential use of technology within education or educational technology. Educational technology, unlike technical education, which aims at certain skills development, focuses on producing a

higher order thinking and critical consciousness. Such consciousness and ability to make historical, social, political connections promotes creation of relevant knowledge that can be used by learners to improve their lives. In other words, use of technology for educational purposes can lead to empowerment of people and therefore can bring about significant human and social development.

The issue of justice and equity is at the heart of critical pedagogical research. The majority of the population in Pakistan, as in many other developing countries, falls on the wrong side of the digital divide. Children, youth, women, and members of minority groups, mainly from poor neighborhoods, often find themselves facing many challenges. They are caught in a vicious cycle of poverty, violence and abuse, all of which can be traced back to a lack of education and knowledge about their own rights. Technology has the potential to further intensify urban-rural, gender, ethnicity, age, and, income disparities between rich and poor. Therefore, it becomes ethically essential that, in any attempt to address matters related to technology, special attention is given to the disadvantaged groups that are on the wrong side of the divide. Privatizing primary and secondary schooling in Pakistan might not be the best solution to solve educational problems.

The current privatization practice in the introduction of technology in public schools is a unique mix of bureaucratic authoritarianism plus profit-making self-interest on the part of private parties. I believe that such a system will inevitably fail the yield results expected of either private system of education or a public one, which in the long run can prove to be extremely detrimental for Pakistan's stability. Bureaucratic authoritarianism, the insecurity of successive political and military regimes and religious fundamentalism,

have all rendered many subjects and issues sensitive and barred from public enquiry and debate; therefore censored from the curricula. Similarly, defining education and the role of technology within education in light of short-term economic goals has led to a situation where the importance critical knowledge in Pakistan is not appreciated at all. This is because, as in the case of economic aid and scientific expertise, Pakistan has always relied on theories and methodologies borrowed from Western countries. Many of the ideas that have been successful in the Western context have not provided the desired results in Pakistan because differences in socio-cultural and historical factors were not taken into account when introducing them. This has led to two significant implications. First, in the absence of locally relevant knowledge Pakistan has continued its economic and intellectual dependence on others. Second, since any significant local knowledge has not been developed, therefore, there is no confidence among the Pakistani intelligentsia that they are capable of creating the knowledge required to lead the society towards human, social and economic development (this fact is pretty evident in higher education policy and has become a source of considerable tension as the policy clearly shows a bias towards foreign scholarship). Thus, little effort or resources are committed to creation of the critical knowledge necessary for democracy, equity and participation of masses in the overall social and economic development of the country. A thorough reading of current IT policy in education reveals that Pakistan continues to imitate with respect to the issue of introducing educational technology in Pakistani public schools. Both projects I studied show that proper research was not carried out prior to implementing the projects. Concerned parties and stake-holders were not involved in making decisions about the needs of the community or the education system. The projects are clear examples of a

technological mindset that focuses on learning about technology rather than learning though technology. The current initiatives represent leaping onto the bandwagon of information technology for reasons that are not directly related to education.

Is there light at the end of the tunnel?

Despite the above mentioned problems, I found a tiny minority of teachers trying to use computers as pedagogical tools. For example, the teacher who assigned students tasks to collect information about a specific topic from the internet or the two teachers who confirmed they were using on-line dictionaries to enhance vocabulary and correct their own and their student's pronunciation. The teacher who observed that students were not familiar with terms used in text books showed remarkable insights into the importance of connecting curricula with students' lived experiences. The afternoon school administrator who tried introducing computers in teaching grades 6-8 because he thought the audio-visual capabilities offered by technology could engage young minds and was facing fines for doing so. In one way or the other, all the above examples reveal some understanding how technology can be used as a pedagogical tool. Many research participants in their interviews reveal awareness that technology is both a combination of technical and social factors. I see such instances as indicators of hope and light at the end of the tunnel.

CHAPTER 7

CONCLUSIONS

Education plays an important role in the economic, social and political development of a nation. It is the educational system of a nation that determines its place in the comity of nations, and global economy. It also determines the level of social cohesion, equity and social justice in the society. A well organized and adequately funded educational system grounded in the social, political, cultural and historical ethos of the society not only ensures economic prosperity but also human and social development.

However, in modern times, both in developed as well as in the developing nations, policy-makers find it difficult to strike a balance between the demands of economic development and social justice. Often enough we see the demands of the former take precedence over the exigencies of the latter. One manifestation of this trend is apparent in the confusion of development with growth. This mistaken view leads to an articulation and organization of the educational system that forsakes social justice over quantitative economic gains. A net result of such ill prioritized organization of educational systems comes out in the shape of fractured social networking and hierarchical social orders as well as the inequitable division and redistribution of social and economic resources.

Dilemmas associated with this balancing act are naturally apparent in the decision-making in their educational realms. In other words scarce resources have to be allocated in a way that the demands of productivity and economic growth are balanced with the necessity of building a socially just and democratic society. However, historically most of the developing nations have ended up preferring the former over the latter. In the current

age marked by the importance and currency of information and knowledge, developing nations such as Pakistan are also facing another dilemma in education policy making: how to utilize technology to expand the knowledge base and eventually become a part of the global knowledge society? Even a cursory examination of educational decision-making in a developing nation like Pakistan suggests that one of the major perceptions in the educational discourses of these nations is that the fastest route to becoming a part of the global knowledge economy and society goes through a rapid technologizing of the educational system. In other words, introducing computers in education is widely considered to be a short cut to becoming a knowledge based society. In my opinion such perceptions are turned into beliefs by the omnipresence and dominance of the global discourse on technology in education. This global discourse through various means such as research in developed societies, treatises of powerful international agencies and think tanks such as UNESCO, OECD, the World Bank and the IMF, to name a few, along with pronouncements in the media and publications constantly convey the message that computerization of education is the harbinger of social and economic change. It is, in other words, the messiah for whom the educationally and economically impoverished nations of the South have been waiting.

The dominance of the discourse eclipses many questions that are of critical importance to the developing nations. Some of the key questions in this respect are: Do the developing nations have the resources needed to technologize their education systems? A related question in this respect is: Given the paucity of resources and the fact that access to education is still not optimal in these societies would expansive introduction of technology help in addressing issues of access to education? An even

more important question in this respect that seems to have been overshadowed by the global rhetoric on technology is: What kind of technology is needed to address the educational problems in these nations. Associated with this are questions about the relevance of imported technology to the educational and societal needs of the developing nations. Finally, as my research indicates the all important question: Do these nations have the educational and social capital to absorb and capitalize on the technology being introduced?

It is in the context of the above stated questions that I undertook my doctoral research. However before reporting my research findings I find it important to state that that my research is not a tirade against the introduction of technology in the educational systems of developing countries in general and in Pakistan in particular. I would like to reiterate that the importance of technology in education cannot be undermined. There are compelling reasons for developing nations like Pakistan to introduce technology in their educational systems. It is also an undeniable fact that the sooner this happens the better it will be. I also believe that the potential advantages of doing so are compelling. Introduction of technology, at least in theory, has the potential of closing the 'digital divide' between information haves and have-nots both between and within societies. Potentially this will close the knowledge gap between the info-rich and info-poor of the world. Furthermore, introduction of technology also has the potential to help developing nations leap-frog some snags and complexities of development and join the ranks of knowledge-based economies and societies.

In educational terms, the introduction of technology based on critical reflection and a wider societal consensus can have many far reaching advantages. For example,

technology can help in ultimately lowering costs associated with access to education. But for this to happen careful consideration of the placement of technology at key locations is one of the points that has to be thoroughly considered before spending valuable resources. Similarly, educational and pedagogical resources available through the use of technology can fill the void created by under-funding of libraries. It can also be instrumental in developing teaching techniques that move away from traditional rote memorization methods. Last but not least, introduction of computers has the potential of networking learning and teaching communities. However, in order to realize fully the potential of technology in education, it is imperative that critical reflection on the aims of education, a wider dialogue at the academic as well as societal levels, a gestation period that could double as a preparatory phase, followed by a sincere and well coordinated implementation planning, precede the actual (and costly) introduction of computers into classrooms.

I started my research endeavor with the following broad objectives and questions:

Objectives

- To examine the articulation and the implementation of the policy that guides the introduction of technology in Pakistan's public schools.
- To explore what impact the introduction of technology has on issues related to teaching, learning and educational development in Pakistan.

Questions

- How are the Pakistani state and policy-makers articulating the introduction of educational technology? What ideological global and local perspectives are at play in the introduction of educational technology in Pakistan?
- How is the policy on introduction of educational technology being implemented and how do various stakeholders perceive the introduction of technology in education?
- How does this policy affect issues related to teacher training, teaching methods, learning, curriculum integration, evaluation?
- Does the introduction and use of technology in education necessarily result in raising educational standards or lead to the empowerment of people?

Let me summarize answers to these in the light of my research findings reported earlier in chapter 6. The first question I asked sought to explore the articulation of Pakistan's policy on the introduction of computers in its public school system. However, before I answer this question let me briefly try to clarify one of the misconceptions about the attitude of the Pakistani state and its decision-makers towards education. It is a common belief in Pakistan that education is the last priority of the state. While this belief reflects a general truism, my research shows that it needs to be qualified. The history of educational policy-making in Pakistan shows that, on one level, namely, general and social sciences and humanities education, the policy of the state is motivated by a desire to control the minds/bodies of its populace. On the second level, i.e., the higher one, technical and vocational education policies have been motivated by a desire to produce a labor force for either the export substitution industry (1947-early 70s) or for the global

market (1980s onwards). The first motivation is intrinsically linked to the second, in the sense that the construction of non-questioning minds and control over them is a prerequisite for the production of a labor force that suits the peripheral and global capitalist elite. Thus, in this sense, it is not that the state is disinterested in developing education in the country; on the contrary, it only seems that its priorities and motivations are misplaced. My research findings show that the recent policy of introducing computers in education is also motivated by the desire on the part of the state to increase economic productivity. It is also clear from this that issues of equity and social justice as aim of education are not even on the radar in this respect.

In light of the arguments presented in chapter 6, it becomes clear that apart from the above-stated historical orientation of the state and policy-makers in Pakistan, the articulation of the policy under study is also influenced by regional, global and local factors. I briefly explicate these below:

First, there is a dominant feeling and perception among Pakistani decision-makers and policy planners that Pakistan has been left out of the global economy due to its underdeveloped technical knowledge base. Important in this respect is the inevitable comparison with India– the traditional foe– and to some extent with Malaysia (the technological success case in the Muslim world). There is thus a desire on the part of Pakistani decision-makers to play catch up with India and in doing so also jump on the bandwagon of globalization and thus reap the windfall of outsourcing contracts that are flowing East (mainly to India and China). However, what these decision-makers fail to take into account is the fact that India embarked on the path to technologize its knowledge base long before Pakistan. For example, India has a renowned network of

technical institutes (IITs; Indian institute(s) of technology). Additionally, these institutions have a national, merit-based, highly competitive admissions process. There is also an education system that feeds these institutions. I was told by a senior technocrat who was MIT's liaison in Pakistan for a number of years that initially MIT offered to set up these institutions in Pakistan, but for some politically naive reason the offer was turned down. In effect, Pakistan does not have the knowledge base from which either to play catch-up with India or Malaysia or to jump on the sub-contracting bandwagon. More importantly, even if Pakistan were able to do either of these things what exactly would be the benefit for Pakistan other than earning foreign exchange (which incidentally will be spent on the burgeoning defense budget and repaying the debt). On the basis of my research it is safe to argue that Pakistani decision-makers have not thought beyond the 'earning foreign exchange' (learning for earning rather than leaning for social and human development) dimension. As I demonstrate in chapter 6, the 'technology-in-education' policy is not geared toward knowledge construction 'with technology'; rather, it is geared towards knowledge construction 'about technology'. The influential literature in the field suggests that a narrow techno-centric educational vision will never result in human and social development.

My research also shows that, historically Pakistan's educational discourse and resulting decision-making has been motivated by an economic focus, i.e., education has been seen predominantly as a means of economic ends and not as a conduit for human development. The logic underlying this thinking assumes that development will naturally follow growth. Resultantly, education has never been planned in such a way as to produce knowledge that can lead to an equitable social order. My research shows that the

current push for introducing technology in education is based on similar assumptions that do not differentiate between growth and development. Furthermore, there is the undeniable influence of global and technological discourses on Pakistan's educational policy making. The current neo-liberal economic discourse that articulates technology-in-education primarily in economic terms has further pushed Pakistani decision-makers to view educational technology only as a means to economic ends and not as a *via media* for the construction of knowledge that is socially relevant.

In light of the above discussion it is safe to conclude that the articulation of technology in education as a solution to educational problems and as a source of equity for all is more rhetorical than real. Evidence presented in chapter 6 demonstrates this on several levels. To begin with, there is a striking absence of an understanding of and differentiation between the meaning of, IT, technical knowledge, educational technology and the role computers can play as tools to enhance and create knowledge. A reading of the policy documents, as well as interviews with policy and decision makers, reveals that all three notions are used interchangeably without any real effort to define or understand them. This leads to distortions in the conceptualization of a coherent vision of what and how technology needs to be introduced in education.

This lack of a definitional exercise leads to a related anomaly, i.e., a lack of definition and understanding of the relationship between education and technology. For example, there seems to be no clarity on whether technology is a means to an educational end or an educational end in itself. In conversations with those involved in key areas of the introduction of technology in education in Pakistan, it became abundantly clear that such questions have not been raised before the policy articulation. It is also clear that no debate

either at the decision-making level or in the academic or public levels took place in this respect. Thus, it will not be too farfetched to argue that educational technology policy in Pakistan is essentially based on shaky conceptual grounds.

Secondly, I sought to examine the implementation of policy that was articulated (influenced by factors stated above). My examination and analysis of the two projects related to the introduction of computers in public schools that I took as case studies reveal a number of drawbacks that can be attributed to the faulty articulation of technology in education policy by Pakistan's policy-makers. It is, for example, clear that the lack of clarity in understanding the nature and direction of computers in education resulted in a less than adequate coordination between the various levels of educational establishment in Pakistan. As I explain in chapter 6, at each policy-making and executing level namely the federal government, the provincial government (Punjab in this case), the district and school administrations technology in respect to education is defined and understood differently. What, however, is common at all levels is that it is treated more in financial terms than in terms of educational value and knowledge construction. This lack of definition is also translated into ad hoc-ism and the resultant confusion that is prevalent in most of the related projects and the decision-making.

Thus, we see a lack of ownership of the two projects by the educational establishments at all levels, i.e., federal, provincial and district. This lack of ownership, as noted earlier in chapter 6, results in disagreement over key issues such as the hiring and training of teachers and support staff, a lack of willingness on part of the federal and the provincial governments to fund infrastructure development, sub-letting of public educational institution to for-profit businesses, etc.

The third question that I raised sought answers regarding the effect of the introduction of computers on issues related to teachers' training, teaching methods, learning, curriculum design and integration and methods of evaluation. My research results suggest that the policy falls short on almost all accounts as it fails to turn around the situation in these areas. My purpose here is not to sound like a prophet of doom. Rather, it is to point out the areas where improvement is needed in order to properly realize the potential of computers in the educational system.

Let me start with the issues related to curriculum. In the National Educational Policy 1998-2010, the emphasis is clearly pedagogic, i.e. "to emphasize different roles of computers as a learning tool in the classroom" (GoP, 1998, p.89). However, the curriculum designed and approved by the Punjab Text Book Board is purely vocational in the sense that it emphasizes skill and drill. Such curriculum is based on narrow techno-centric view of computer rather than the real potential of the computer as an educational tool. Furthermore, the lack of vision also results in a gap between theory and practice. For example, while the policy seeks to modernize education via the application of technology, scant attention seems to have gone into curricular reform.

Furthermore, little or no effort seems to have gone into developing cross-curricular tools that can facilitate learning across the board. Similarly, no effort has been made so far to develop an integrated curriculum, and this is unfortunate as there are two obvious disadvantages to having a non-integrated curriculum. First, on a broader level, it takes away technology-aided education's ability to produce and impart socially and culturally relevant knowledge. In other words, a non-integrated curriculum, especially the way it is being implemented in Pakistan, moves away from the humanistic model of technology

integration (in educational processes) and thus produces only, what critical theorists of educational technology term as 'operators' of computers (as against learners through computers). There is enough evidence from the experiences of developing countries that such an education is incapable of producing conditions for genuine development. The cases of South Korea and Cyprus are good examples in this respect. Both countries started with techno-centric introduction of technology in education but soon realized that this was not enough. Furthermore, little or no attention seems to have gone into the need to develop local software in the local language. This fact alone makes some of the on-line information irrelevant to the lived experiences of the students. A majority of students in schools where computers have been introduced have only a working knowledge of English and thus they may not be able to take full advantage of the technology.

With respect to teacher training, the situation does not present an encouraging picture either. To begin with, in the overall sense, educational technology policy in Pakistan treats the issue of teacher training primarily as a resource allocation/financial issue. The net result of this is that decisions regarding the hiring and training of teachers who can carry out the key objectives of the policy, i.e., to teach/facilitate the use of technology as a learning tool, are based on economic logic. In other words, while expensive technological hardware is being provided on a priority basis to the project schools, there is bureaucratic tussle and leg pulling when it comes to hiring and training teachers who can make use of such hardware as a learning tool. As one of my research participants so aptly stated, "if the government thinks that these computers are going to create knowledge and student's learning by themselves then it is sadly mistaken" (interview). Furthermore, even teachers who are hired (mostly by the private afternoon

administration) are engaged on the basis of their knowledge of computers and not necessarily how to use them for educational purposes. Similarly, teacher training programs in this respect are also at best refresher courses in the operation of computers and not in their use for learning or knowledge creation.

The irony becomes further apparent in interviews with teachers, parents, and administrators and when looking into the kind of training that is being provided to the teachers. What little teacher training is available relates to enhancing teacher's skills about hardware and software, but does not address any pedagogical issues. In dominant rhetorical terms, teachers are supposed to use the computers for both vocational and pedagogical purposes in the classroom. At the same time, the training provided to teachers and the curriculum they are supposed to teach gives the clear cut message that IT skill is more important than the pedagogical/educational use of computers.

In the absence of proper and adequate teacher training (training is provided by computer vendors who are selected for supplying the hardware and is mainly related to the operation of said hardware), teachers in schools where computers have been introduced by and large follow the conventional teaching methods that in themselves are a mixture of the remnants of the erstwhile colonial pedagogical system and traditional pedagogical practices from the last century. As a result, teaching 'about' the computers and not teaching 'with' them involves rote memorization of irrelevant details and one-way communication that is teacher-centered, among other such methods. Questioning, imagination/innovation on the part of students is discouraged (sometime with corporal punishment) and students are evaluated for what they do not know rather than for what they do.

However, what also emerges from my research findings is the fact that, despite the abovementioned constraints, some teachers and students have turned the situation to their advantage. There are clear signs of teachers' and students' agency. This agency becomes apparent time and time again in case the of teachers who, despite little or no training, still use technology as a learning tool and who, despite the handicap innovate in terms of methods to inculcate cross-curricular competencies. Agency is also reflected in student's use of technology.

To sum up, Pakistan cannot avoid the challenge of introducing technology into the schools. If anything, the effort is already too late. There are compelling reasons to promote the use of technology as an educational tool. However, it is important for policy-makers and educational planners to realize that any effort at introducing technology in the educational realm requires theoretical discussions as well as a societal dialogue so as to arrive at a framework outlining technology's place in educational and societal contexts. Such theoretical discussions require philosophical understanding and a consensus about the role education has to play in Pakistani society. Knowledge cannot be created simply by importing technological hardware from other countries, nor can knowledge be created without making learning relevant to the needs of local populations. This means Pakistan can no longer rely on imported theories of education. As critical theorists inform us, the issues related to the educational use of technology are country-specific. Therefore, Pakistan needs to develop and introduce educational technology to seek solutions for its unique economic, social, cultural and human and social development requirements based on its present level of development and evolution. What is needed is a country-tailored educational policy for schools. In other words Pakistan needs to develop its own version

of educational theory that reflects the aims, objectives and structures of the Pakistani educational system. Only after doing so can Pakistani educational decision-makers formulate a model of technology integration in education that will be responsive to the real needs of Pakistani society.

Under current global conditions, there can be important consequences for developing countries like Pakistan from the incorrect/misdirected introduction and use of technology within education. It is not only the cost factor that makes the stakes very high but also the psychological setback people will once again experience when technology in education (which is being promoted as a great equalizing force and a guarantee of economic development) fails to deliver such miracles.

Critical pedagogists have pointed out that the developed world started with the skills based model of introducing technology within education and that, after spending billions of dollars on hardware, software, teacher training and research, it has now come to conclude that the techno-centric view does little to promote educational activities. Research indicates that cultural, political and socio-economic factors, along with teaching methodologies, are major determining factors in how technology can influence educational achievement. Thus, before introducing technology, various associated factors need to be considered in great detail. In other words my argument is not that technology should not be introduced in educational settings in the developing world. Rather, I argue that such an introduction has to follow a process of critical reflection. Such a reflection must take into account both the local as well as the global dimensions of introducing technology in educational realms. Continued disconnectedness from global economic and technological processes can result in developing countries like Pakistan

becoming less competitive in an increasingly wired global world. The digital divide will reduce Pakistan's chances of participation in and benefiting from electronically networked global knowledge systems. However, technologizing of the educational realm must not only be guided by economic motivations. It must also be relevant to the social, political and cultural ethos of the society.

The objective of introducing technology should be the creation of knowledge rather than the development of a few technical skills. This is particularly important as technical skills become obsolete with improvements in rapidly changing technology. In a new knowledge-based world system, lack of knowledge means being knowledge poor in comparison to the knowledge rich. It also means a continued dependency on a minority elite for making decisions that affect majority lives at the individual, communal, provincial, federal, national and international levels. The knowledge gap leads to disempowerment and therefore disassociation with national and global politics and as such it directly affects the lives of the greater part of the population in the developing world.

The most pressing problems that Pakistani society faces today are related to poverty, exclusion from political participation, health, unemployment and other issues of human development. Any implication that merely acquiring technical skills will solve issues creates an illusion that conceals the real issues. This is not to say that technology does not possess the power to challenge the existing hierarchies and the status quo. In more than one way, technology has the potential to address a majority of educational issues that developing countries like Pakistan face.

However, it is important that technology be introduced in a manner that addresses the needs of the local population rather than making them dependent on imported ideas, software and hardware. Such an introduction is only possible when local populations are able to generate and create their own knowledge. Technology has the potential to provide information, but that information can only be converted into relevant knowledge by using critical thinking, which requires juxtaposing the local (historical, cultural, political and economic) with the global.

In the next section I present some recommendations to redress the situation.

Recommendations

Vision

My research shows that the policy to introduce technology in the educational realm in Pakistan suffers from an ambiguous articulation of the educational problems and change. Problems in this respect can be addressed by developing a clear vision that could serve as a foundational base for achieving consensus about both 'what counts as education' and 'how technology can help in achieving educational goals'.

i) Pakistani policy-makers must first articulate a long term-vision of the goals, aims, and objectives of education in general and of the Pakistani educational system in particular. The issue of integration of technology in education must be based on this vision and relate to its aims in meaningful, practical and relevant ways.

ii) There is clearly a need to distinguish between the fields of information technology, technical knowledge and educational technology and yet to recognize the vital links between these fields.

iii) Policy with respect to the introduction of technology in education should be formulated in support of the general objectives of the educational process as well as of national social and economic requirements of the present and future. It should be directed to both the structural as well as the qualitative improvement of education.

iv) While it is not completely possible (or desirable) to extricate the policy from the global discourse on educational technology, Pakistani policy-makers must make an effort to foreground the national educational context. In this respect the policy must aim to introduce educational technology to seek solutions for Pakistan's unique educational, economic, social, cultural and human and social development requirements.

v) The policy must clearly delineate the short term and long term aims, goals and targets. These goals and aims should be tied in to and operationalized in the context of the short, medium and long term educational and developmental needs of Pakistani society. The policy must provide a clear rationale for the reasons as to why technology is being introduced into schools and this rationale should be linked to the unique learning needs of students in the socio-cultural context of Pakistani society.

vi) The policy to introduce technology in education should be based on an incremental approach. The initial emphasis should be on teacher training and

development of locally relevant educational software. After that schools should be equipped with appropriate hardware and software.

Coordination

Successful introduction of educational use of technology involves a consolidated effort. My research reveals that due to the lack of a coherent vision, the policy to introduce technology in education in Pakistan suffers from a lack of coordination between different levels of educational establishment in the country.

i) There is a need to develop better collaboration between different levels of governance (federal, provincial, district and schools administrations) and also between a number of departments, such as the Federal and provincial ministries of education, curriculum wing of the ministry of education, university of education (for teacher training and faculty development), the private sector, the finance and information technology ministries, etc.

ii) Within the perimeters of a sustainable public-private partnership, the government must provide leadership and vision, facilitate, coordinate, establish quality assurance and ensure that the integration of technology in education has far reaching benefits for the social, economic, and educational progress of the country.

iii) While the education authorities should have primary responsibility, groups of relevant stakeholders, such as representatives of non-governmental organizations, employers, small enterprise owners and entrepreneurs, teachers, examining bodies and administrators, parents, former pupils, students and

youth organizations and representatives from the community at large, should be actively incorporated in policy formulation and in the planning and implementation process.

Finance

All educational projects and especially technology-related projects should have a sustainable financial commitment along with an analytical and evaluative component.

i) Efforts should be made to avoid introduction of programs and projects that are based on a one-time infusion of funds.

ii) All project designs submitted for approval must be evaluated on the basis of comprehensive long-term financial forecasting for at least the next ten years.

iii) Since developments in the field of technology are extremely rapid the project planning must take this fact into account when preparing financial feasibility.

iv) While public-private partnership in the realm of education and the introduction of educational technology is desirable and can prove to be beneficial, it is incumbent upon the decision makers to ensure that profit motivation does not overshadow educational goals.

Monitoring and Evaluation

i) The policy on introduction of educational technology must have a comprehensive, well-articulated and well-coordinated monitoring regime.

ii) The monitoring and evaluation regime must address not only the financial aspects but also the issues of sustainability, teaching and learning, curriculum, relevance, coordination and outcomes.

Content and Curricula

So far the focus of the educational policy-making in Pakistan (including that of introduction of technology in education) has been quantitative. This focus needs to be broadened so that issues of quality complement quantitative issues such as access, etc.

i) Curricula and course content must be designed to ensure that the education is not only about technology, while the emphasis should be on teaching how to learn with the help of technology.

ii) Special emphasis should be placed on curriculum development, on research concerning teaching and learning methods and materials, and, where the need exists, on technologies and techniques applied to development problems.

iii) Technology must be integrated into the curricula across the board and not introduced as a stand-alone subject.

iv) Curricula and course content must be made relevant to the social, political, cultural and educational realities and the lived experiences of the students and teachers.

Teachers' Training

i) Teacher training programs need to address pedagogical issues involved in the use of educational technology.

ii) Currently, the training with respect to technology in education is available to a very limited number of teachers. Teachers' training in this respect should be made more universal across regions, urban and rural areas, subjects and different tiers of schooling.

iii) Teachers should be trained not only to teach 'about' technology (as is the current trend) but also to teach 'with' technology.

iv) There is a great need to enhance teacher morale. Presently, Pakistani culture, educational practices and policy severely underestimate the role of good teachers in the success of the educational system. There must be a concerted and wide-ranging effort on the part of the national and the provincial governments to raise the social status and morale of the teachers. There is a need to set up effective professional development and training programs that address both technical and pedagogical issues for teachers and practitioners.

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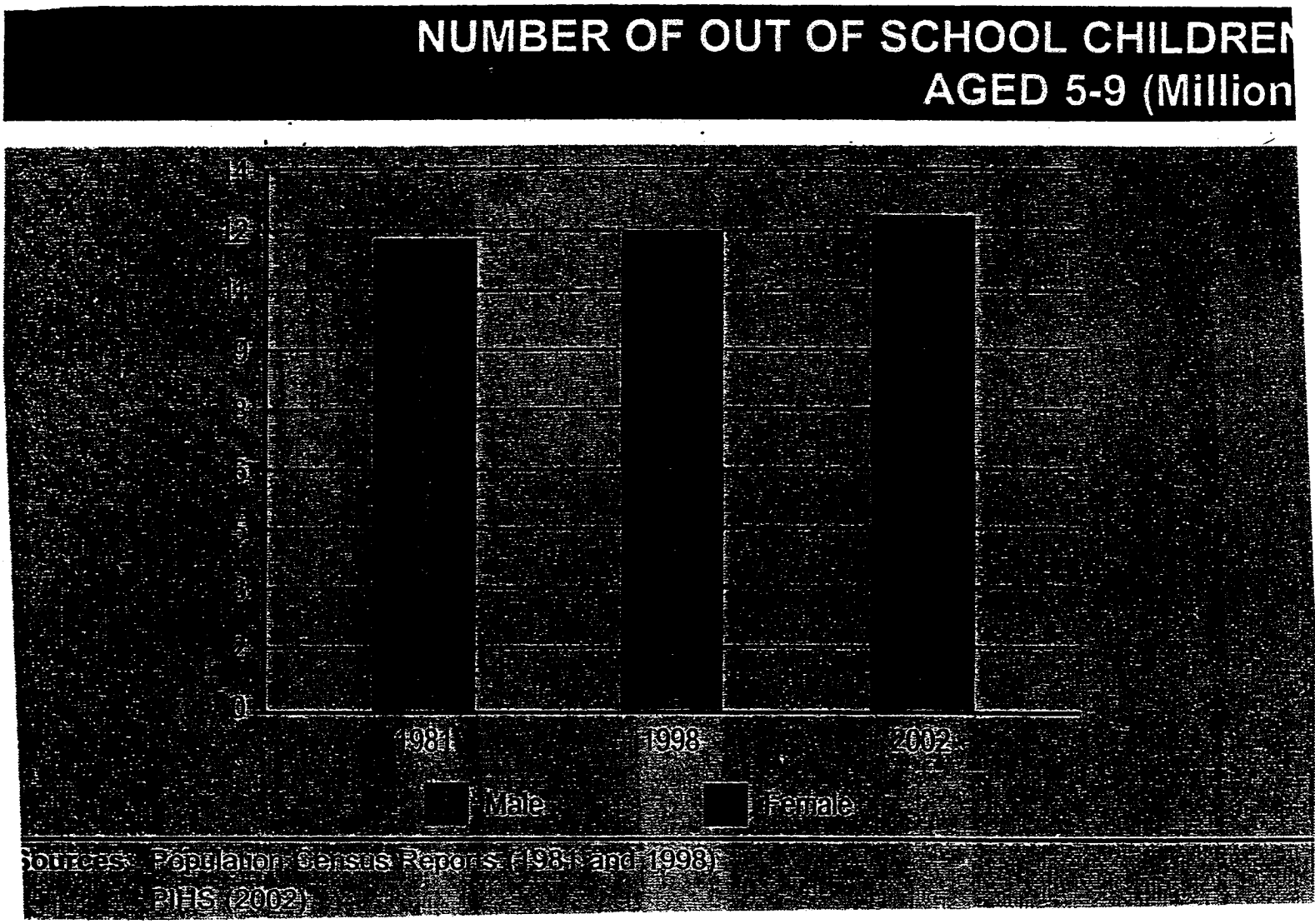
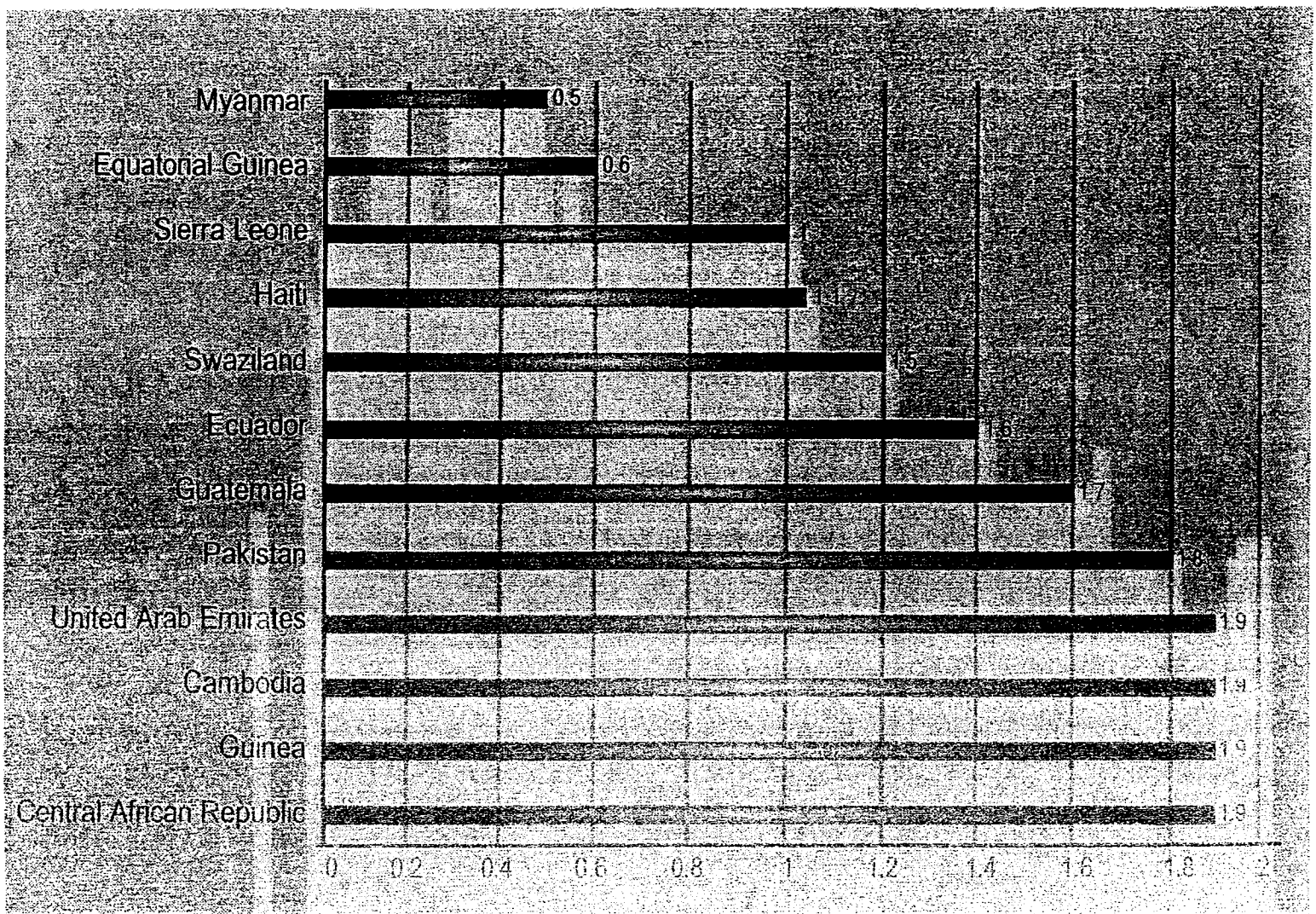
Appendix I



Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix II

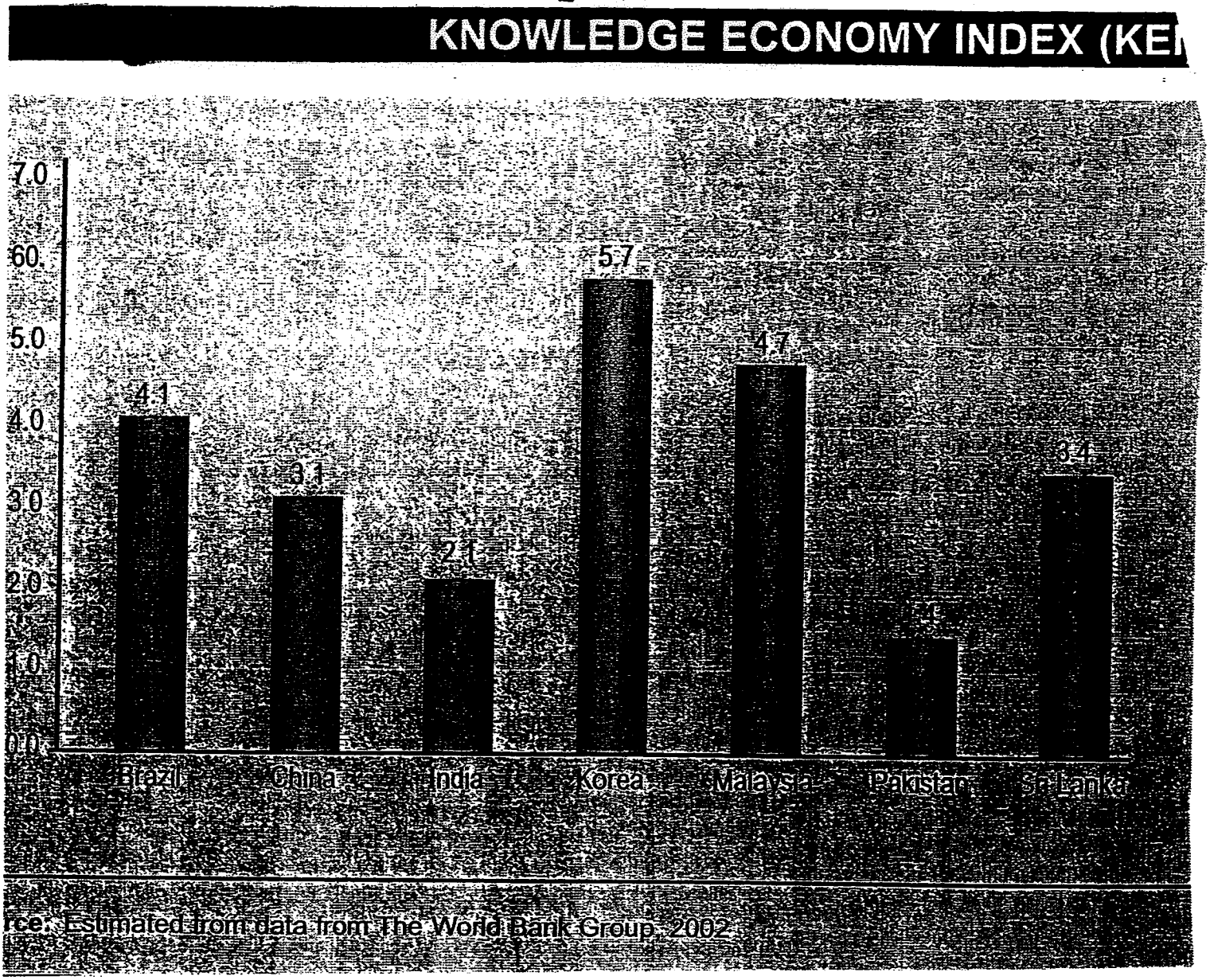
PERCENTAGES OF GDP SPENT ON EDUCATION



Source: UNDP, Human Development Report (2003)

Source: Social Development in Pakistan, Annual Review 2002-2003

Appendix III



Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix IV

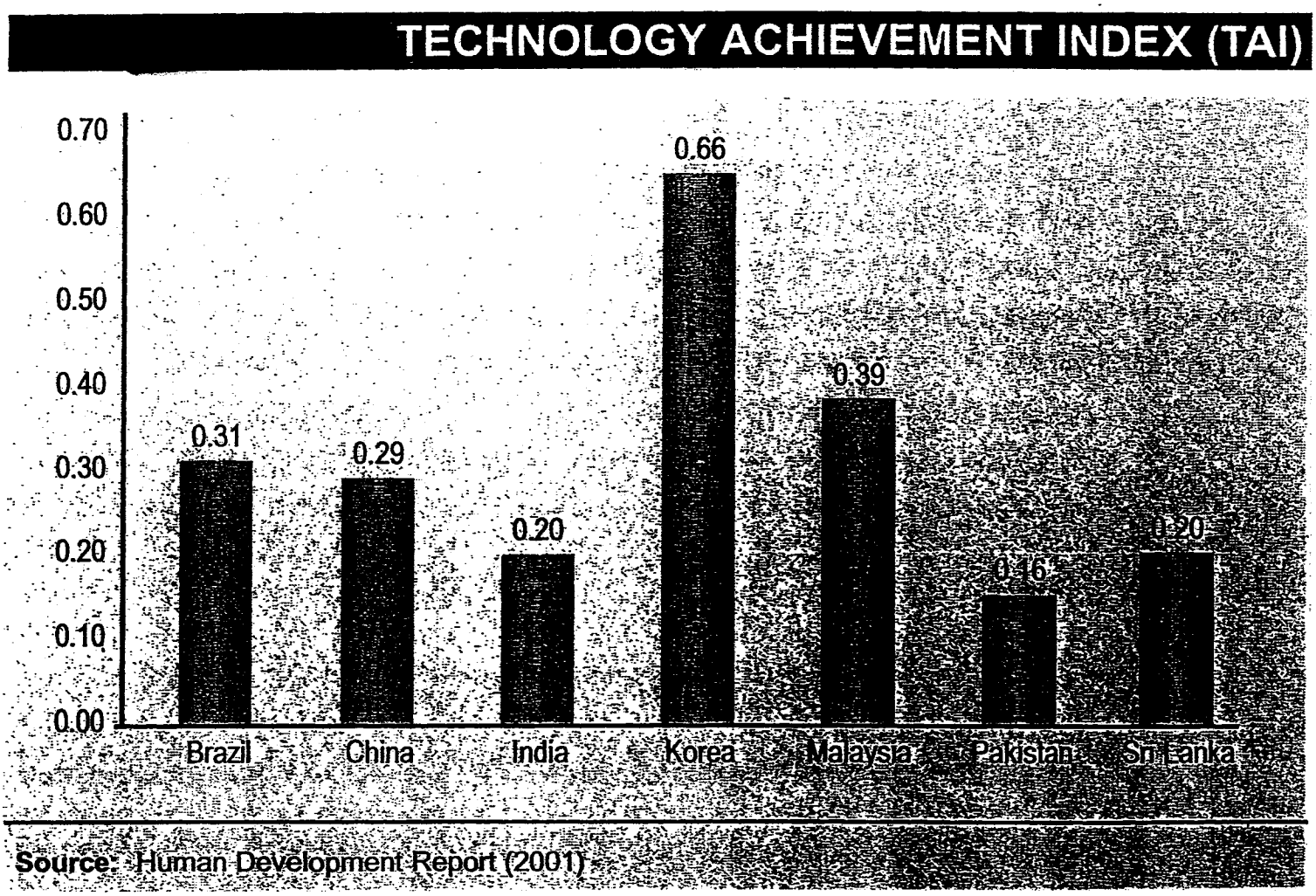
KNOWLEDGE ECONOMY INDEX: COUNTRY RANKING

	Brazil	China	India	Korea	Malaysia	Pakistan	Sri Lanka
Economic Incentive Regime	**4.16**	**1.66**	**2.5**	**4.16**	**4.16**	**1.66**	**5**
Property Rights	5	2.5	5	2.5	5	2.5	5
T/NT Barriers	2.5	0	0	5	2.5	0	5
Regulation	5	2.5	2.5	5	5	2.5	5
Information Infrastructure	**6.05**	**3.80**	**2.14**	**7.93**	**6.38**	**2.09**	**2.90**
Telephones	7.44	6.41	3.71	9.44	7.88	3.1	4.73
Computers	5.99	4.34	2.35	8.43	6.96	2.75	3.16
Internet Hosts	4.74	0.67	0.36	5.93	4.3	0.44	0.83
Innovation	**1.56**	**3.13**	**1.44**	**3.15**	**3.35**	**0.49**	**1.11**
Manufacturing Trade	0.12	1.11	0.08	1.95	6.57	0.48	1.73
Researchers	0.28	5.68	1.42	1.03	0.02	0.09	0.03
Technical Papers	4.29	2.62	2.84	6.47	3.46	0.91	1.59
Education	**4.68**	**3.85**	**2.20**	**7.67**	**5.00**	**1.18**	**4.43**
Adult Literacy	7.61	7.39	3.06	9.65	7.95	1.22	8.65
Tertiary Enrolment	1.46	0.56	0.79	7.3	1.12	0.34	0.45
Secondary Enrolment	4.97	3.61	2.77	6.06	5.94	2	4.19
Socioeconomic Performance	**6.67**	**8.21**	**5.92**	**8.31**	**7.87**	**4.82**	**7.09**
GDP Growth	6.4	10	7.8	7.66	8.41	6.78	7.48
Human Development Index	6.94	6.42	4.05	8.96	7.33	2.86	6.7
Knowledge Economy Index	**4.11**	**3.11**	**2.07**	**5.73**	**4.72**	**1.36**	**3.36**

Source: Estimated from data from The World Bank Group, 2002

Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix V



Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix VI

TECHNOLOGY ACHIEVEMENT INDEX: COUNTRY RANKING

	Brazil	China	India	Korea	Malaysia	Pakistan	Sri Lanka
Technology Creation							
Technology Achievement Index (TAI)	0.31	0.29	0.20	0.66	0.39	0.16	0.20
Patents Granted to Residents (per million people, 1998)	2	1	1	779	-	-	-
Receipts of Royalties and License Fees (US$ per 1000 people, 1999)	0.8	0.1	-	9.8	0.0	-	-
Diffusion of Old Innovations							
Telephones (mainline & cellular, per 1000 people, 1999)	238	120	28	938	340	24	49
Electricity Consumption (kilowatt-hours per capita, 1998)	1,793	746	384	4,497	2,554	337	244
Diffusion of Recent Innovations							
Internet Hosts (per 1000 people, 2000)	7.2	0.1	0.1	4.8	2.4	0.1	0.2
High and Medium Technology Exports (as % of total goods exported, 1999)	32.9	39.0	16.6	66.7	67.4	7.9	5.2
Human Skills							
Mean Years of Schooling (age 15 and above, 2000)	4.9	6.4	5.1	10.8	6.8	3.9	6.9
Gross Tertiary Science Enrolment Ratio (%, 1995-97)	3.4	3.2	1.7	23.2	3.3	1.4	1.4
Technology Achievement Index (TAI)	**0.31**	**0.29**	**0.20**	**0.66**	**0.39**	**0.16**	**0.20**

Source: Human Development Report (2001)

Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix VII

PHYSICAL CONDITION OF PUBLIC SCHOOLS

A review of the physical conditions of public schools shows that 16 per cent of them are without a building, 55 per cent without a boundary wall, 49 per cent without electricity, 44 per cent without water and 60 per cent without a latrine. There is, however, considerable variation between the provinces, between urban and rural areas and between boys' and girls' schools.

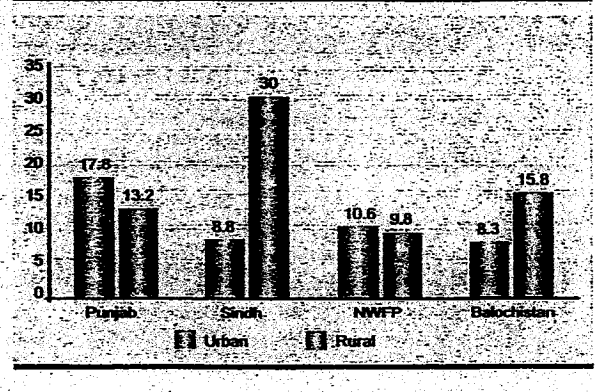
Province-wise, the most dismal situation appears to exist in Balochistan. Except for Sindh, where the percentage of schools without buildings is the highest at 27 per cent, Balochistan presents the worse case scenario in all other respects: 74 per cent of schools are without a boundary wall, 93 per cent are without electricity, 78 per cent are without water, and 83 per cent are without a latrine. The implication is that over three-fourths of schools in Balochistan are bereft of the most basic physical facilities and a meager 7 per cent have electricity. Balochistan is, however, relatively better endowed in the matter of school buildings.

Urban Punjab also does not manage very well in some respects. The largest percentage of schools in urban areas that are without a building, without a boundary wall and without electricity are in Punjab, with the respective percentages being 18, 54 and 84. It, however, fares well with respect to availability of water. On the whole, rural Punjab fares well in all respects, except availability of a latrine, compared to other provinces.

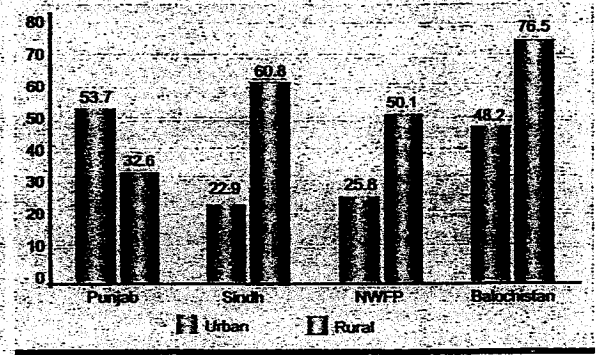
Urban Sindh fares particularly well in schools without a building, with the percentage being as low as 9 per cent. The percentages for schools without boundary walls, without electricity, and without a latrine are also the lowest for urban Sindh. Rural Sindh does not perform as well. About 30 per cent of schools are without a building, the highest in rural Pakistan. Rural Sindh only fares worse than Balochistan with respect to schools without electricity and without water.

NWFP presents the best state of affairs in the country. With respect to schools without buildings, with only about 10 per cent of schools are bereft of a building. The percentages are more or less the same in urban and rural areas. The situation in urban NWFP is more or less similar to urban Sindh with regard to schools without electricity and water. Rural NWFP's worst statistic

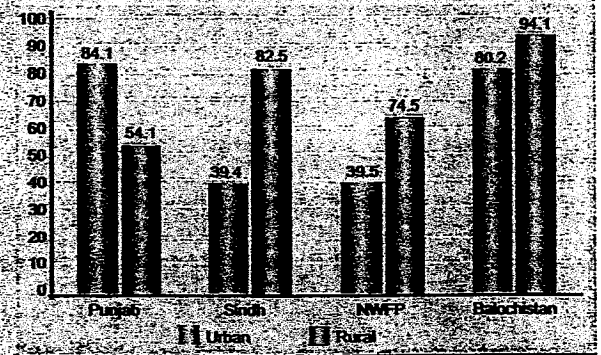
PUBLIC SCHOOLS WITHOUT A BUILDING



PUBLIC SCHOOLS WITHOUT A BOUNDARY WALL



PUBLIC SCHOOLS WITHOUT ELECTRICITY



Source: Social Development in Pakistan. Annual Review 2002-2003.

(Contd.) PHYSICAL CONDITION OF PUBLIC SCHOOLS

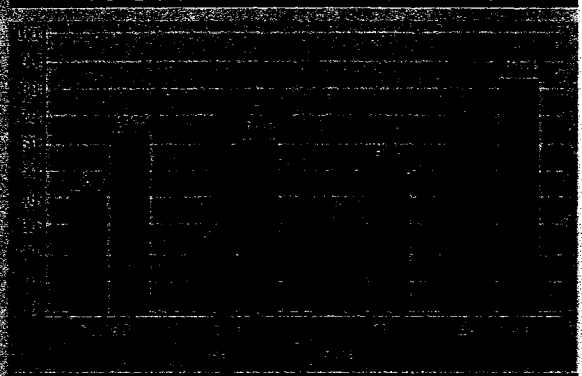
relates to about 75 per cent of schools being without electricity.

Gender-wise, the physical condition of girls' schools appears to be significantly better than that of boys' schools, barring a few exceptions: schools without a boundary wall in urban Balochistan and schools without electricity in urban Punjab and urban NWFP. The best statistic relates to NWFP, where less than 2 per cent of rural girls' schools and less than 3 per cent of urban girls' schools are without a building. The three worst statistics relate to Balochistan, where 91 per cent of rural girls' schools and 79 per cent of urban girls' schools are without electricity, and to Punjab, where 87 per cent of urban girls' schools are without electricity. A somewhat disturbing situation is that between one-fifth and one-quarter of girls' schools in urban areas are without water or a latrine. The situation is worse in rural areas, where about 40 per cent of girls' schools are bereft of these two basic facilities.

PUBLIC SCHOOLS WITHOUT WATER

Source: NEMIS (2001)

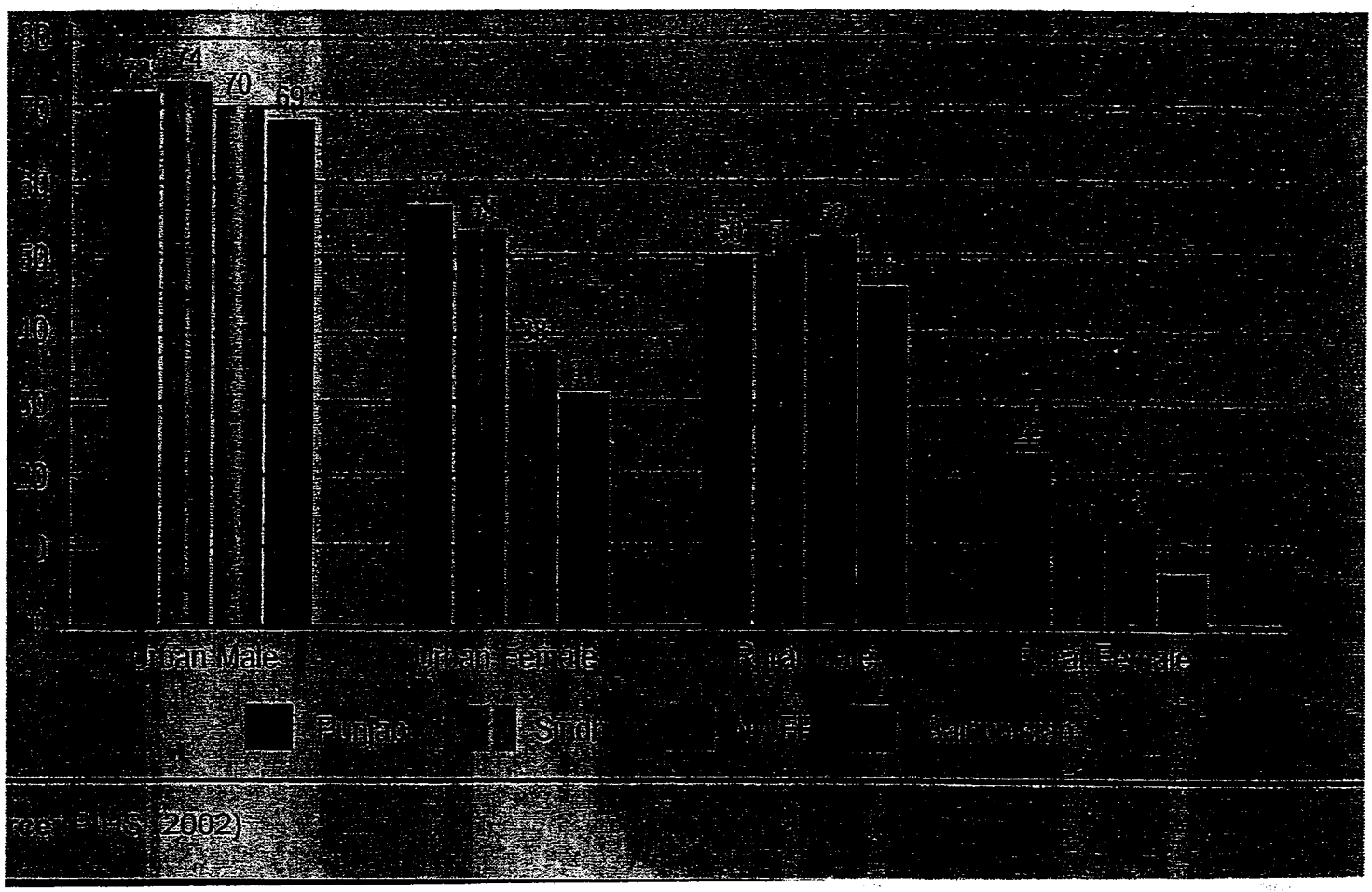
PUBLIC SCHOOLS WITHOUT A LATRINE



Source: Social Development in Pakistan. Annual Review 2002-2003.

Appendix VIII

DISPARITIES IN LITERACY RATES, 2001-02



Source: Social Development in Pakistan. Annual Review 2002-2003.