

TOWARDS BUILDING OPEN LEARNING COMMUNITIES: RE-CONTEXTUALIZING TEACHERS AND LEARNERS

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by

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“Our vision of the coming century is of one in which the pursuit of learning is valued by individuals and by authorities all over the world not only as a means to an end, but also as an end in itself. Hence, much will be expected, and much demanded, of teachers, for it largely depends on them whether this vision can come true.”

Learning: The Treasure Within, Delors Commission Report²

The emergence of powerful new information and communication technologies (ICTs), such as those based on the use of computers and multimedia, digital compression and switching techniques, satellites, fiber-optics and wireless networks, artificial intelligence, and virtual reality, dramatically expand our options for engaging in teaching and learning at the individual, community, and societal levels. ICTs provide opportunities for greater flexibility, interactivity and accessibility. They help visualize applications such as interactive radio and television, videoconferencing, teletext, Internet-based environments of dialogue (ranging from the chatroom to academic discussion circles), Web publishing, and individualized CD-ROM tutorials. Although the future is still only dimly imaginable, one can sense that we are at the edge of something potentially very exciting, extremely big and, quite frankly, truly overwhelming. Discussion around these new technologies thus tends to stir up a whole range of emotions — sometimes rather naive ones — ranging from optimism and hope to uneasiness and anxiety. The reason for this is that, in addition to expanding current delivery options, the emergence of these new technologies present us with the opportunity (some would say force

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² The International Commission on Education for the Twenty-first Century, UNESCO (1996). *Learning: The Treasure Within*. Paris, France: UNESCO

us) to question fundamental assumptions, to re-think existing approaches, to collectively conceptualize and generate new ideas and community-based alternatives and even sometimes, albeit more rarely, to catalyze social and institutional change.

However, to unlock the potential of such technologies, it is critical to revive an age-old discussion over *means* and *ends*. Technology, however sophisticated and inspiring to the imagination of technologists, will not automatically result in the benefits that are sometimes forecast by its advocates. The history of technology shows a disappointing repetition of instances of predicted revolutions that subsequently failed to materialize. In the majority of these cases of stunted growth, the attention to the means overshadowed the concern with the ends. The pursuit of ever more hi-tech forms of technology and increased access to technology can only be justified by our expectations about their potential contribution to a better world. Just chasing after the hottest technologies is a shallow pursuit and not worth the excitement it often generates. The overriding questions are: *What are our goals, how do these goals relate to creating a better world, and how do the technologies we pursue help achieve our goals?*

In the domain of education, a greater level of complexity surrounds these questions. Not only are the emerging technologies affecting the means by which we facilitate learning, they are also influencing the ends themselves. As they both provoke and facilitate the shift from an “industrial” model of society to a post-industrial information society³, they are, in fact, implicitly re-defining the fundamental nature of learning and teaching. For example, the overwhelming amounts of rapidly changing information (and questions about the integrity of much of that information) makes it no longer possible nor relevant to learn — and thus to teach — in the same ways that we used to.

This paper seeks to situate ICTs and their application in the domain of teacher education within the broader construct of “open learning communities.”⁴ It attempts to use the opportunity of discussing ICTs to (1) raise fundamental questions about the ends and means of teaching and learning within a broader social, political, economic and cultural context and (2) explore alternative approaches to building increasingly dynamic learning environments that are

³ It is assumed that its reader is aware of the various connotations of this concept, and particularly of the shortcomings of a descriptor that concentrates on but one aspect of a much more complex whole, failing to bring out the connections between such categories as information, knowledge, wisdom, action, reflection, understanding, creativity, self-realization and self-expression, social participation, and so on.

⁴ The term open learning communities, while including facilities that may continue to be called schools, is deliberately used to challenge the reader to think beyond the traditional school-teacher-textbook model. Many examples exist of alternative learning communities that are to a greater or lesser extent open, such as those in some kibbutzim, Silicon valley, women’s collectives, learning cities, learning organizations (e.g. the Rover Learning Business) and Internet-based environments of dialogue. They actively contribute to more meaningful and relevant individual and collective learning experiences. Also, the concept of communities needs not necessarily be restricted by physical proximity of people.

consistent with and responsive to the needs, interests and aspirations of individual learners and their local contexts/communities.

We begin by discussing evolving notions of learning within a world in transition, characterized by increasingly rapid pace at which things become outdated. Learning is a critical element in responding this situation. Secondly, we try to lay out an expanded vision of teachers and teaching that stimulates and enhances a variety of mediated learning environments. Finally, the paper concludes by posing an alternative conceptualization of teacher education within the broader framework of building and sustaining open learning communities. We argue that simply layering ICTs as technological quick-fixes on top of existing institutions and processes is not enough. Rather, they must seek to create and sustain social and institutional change. It is their success in achieving this which will ultimately determine whether the new ICTs live up to their revolutionary hype.

Learning in a Changing World

Changing perspectives of learning and teaching in the information society

There is an intimate link between developments in the world of learning and those that pertain to the information society. This relationship will be analyzed in more detail in the sections that follow. The learning side of the equation will be tackled first. Two perspectives will particularly be highlighted: the recognition that learning is an innate ingredient of our very humanity and the ensuing concern that conventional learning environments are not well-suited for meeting society's learning objectives.

Learning for life... It takes a lifetime

We live in a time that learning is taking on a distinctly enhanced meaning. It is a time when changes in the learning environment, which have been advocated for decades if not centuries, are becoming necessary rather than merely desirable. Learning is an essential basis for both action and reflection and thus for creativity and problem solving. Learning is a pursuit in its own right which goes beyond the utilitarian conceptions that have for a long time related it almost exclusively to the world of work. In developing and industrialized nations alike, change, and consequently the need to respond and adapt to change and to manage ensuing conflict, are fundamental ingredients of life. Learning is the mechanism through which human beings cope with — and in turn contribute to — change. The possibility to engage in learning throughout one's life and across multiple dimensions of life is thus essential for survival as well as a condition for continual quality of life. The traditional perceptions regarding education, based on the assumption that learning is the prerogative of the young, and that adult learning is at

worst a response to failure and at best a marginal supplement, an exception rather than the rule, are becoming rapidly outdated. Learning is increasingly seen as a *lifelong* and *life-wide* requirement. This is contrary to the notion of learning as a mere preparation *for* life — with a discrete beginning and end — but not as an integral part *of* life.

To be a productive and participating member of society, one needs to be able to continue to learn, to grow with changes in the environment and to respond to the availability of different opportunities. For example, the increasing emphasis on informal sector activities as well as changing patterns of employment cause linear career paths to be replaced by career networks in which people find themselves exploring distinct environments and moving into divergent directions at various stages of their lives. Inherent in the emergence of the information society is also the need to rethink the priorities accorded to work-related activities *vis-à-vis* activities not directly related to the world of work. This is particularly relevant considering that in many societies people now spend decreasing proportions of their active life on what traditionally would be called ‘work’ and increased proportions of it on activities that would traditionally have been seen as pertaining to ‘leisure.’ Quality of life, then, becomes less a function of self-realization in the (formal and informal) work environment and more a dimension of, for instance, social, cultural and political participation in society. The boundaries between work, leisure and learning start gradually to disappear and learning becomes a dimension of a work/learning/leisure merger. Learning for work, learning for leisure, and learning for learning are all valid options within that context.

The above conceptualization requires us to rethink traditional learning goals, such as literacy. Literacy has long been seen as a gateway to the world of learning. However, its definition as the ability to describe and interpret the world in terms of alphanumeric symbols is no longer adequate. There are many literacies and, consequently, illiteracies. Technological illiteracy, political illiteracy, ecological illiteracy, intercultural illiteracy, and so many other ways in which people are hindered in their ability to act and reflect upon their environment are just as important as the inability to read and write. Across these various literacies there is a growing problem of information overload which threatens to paralyze us. The inability to process and critically analyze information is increasingly a concern. Learners must develop the ability to access and process huge volumes of information so as to create meaning and generate new knowledge.

Limitations of conventional learning environments

A second important perspective on learning is the question of unmet learning needs. The world has known unmet learning needs as long as education has been a conscious concern of societies. What is new now is that such unmet learning needs can no longer be seen as isolated

phenomena within the boundaries of particular countries or distinct parts of the world. The world is increasingly becoming a global society⁵ and a learning place in its own right. The extent to which the world will be able to learn, will condition its survival and its ability to make the planet an acceptable, and hopefully desirable, place to live. Global learning depends on the ability of societies to turn themselves into learning societies and of communities within societies to constitute themselves as learning communities. In turn, learning communities exist to the extent that their individual members are learning individuals.

But what is the global reality? As we approach the end of the second millennium, there are still more than 900 million illiterate people in the world. New illiterates emerge every day as the result of inadequate school systems, inappropriate curricula, and insufficient conditions to prevent relapse into illiteracy once people have become literate⁶. More than 130 million school-age children world-wide do not go to school. The millions that do go to school often fall victim to the diploma disease, ending up with learning achievements that do not relevantly relate to their immediate needs nor guarantee that learning sustains throughout their lives.

School systems, as we know them, reflect the requirements of the formal economy and, besides their obvious role in serving the learning needs of new generations, they also serve as channels for the socialization of human beings into the pre-existing socio-economic hierarchies pertaining to the formal system. They are ill-equipped to respond to the learning challenges and opportunities of the future. Schools are burdened with a great deal of pressure due to increasing demand. In the past, they served a smaller and less diverse clientele, often already in many ways pre-selected. Today's schools are expected to carry out the almost impossible task of meeting the diverse needs of many more students. In its advice to UNESCO's Executive Board, the '*Ad Hoc* Forum of Reflection on UNESCO's Role in the Last Decade of the Twentieth Century' concluded in 1993 that "education is increasingly necessary and less and less possible, due to its cost."

Furthermore, many schools are weakened by outdated structures which constitute an impediment to learning. Among these barriers are the continued reliance on the artificial separations between levels of education, such as primary, secondary and tertiary, or between socio-economically biased different tracks of learning, such as academic and vocational or technical. Equally inappropriate are often the ways in which human knowledge has become

⁵ By using the term "global society" the authors are merely referring to enhanced opportunities for people and peoples to connect among themselves, increasing both the possibilities for sharing and conflict. The use of the term should not be taken to imply that the authors feel that what is commonly referred to as the: "global society" does indeed have all characteristics of a true society.

⁶ Attempts to improve the adequacy and insufficiency of school systems are in many countries particularly challenged by high population growth rates.

compartmentalized in stale curricula and presented in ways that are relevant, if at all, only for portions of society. Furthermore, these curricula tend to narrowly concentrate only on a small portion of the intelligence spectrum. During the 1980's various researchers⁷ reviewed and broadened the concept of intelligence. Howard Gardner⁸, for example, identifies at least seven different human intelligences that allow us to engage in learning in order to make sense of the world: (1) language; (2) logical-mathematical analysis; (3) spatial representation; (4) musical thinking; (5) the use of the body to solve problems or to make things; (6) an understanding of other individuals; and, (7) an understanding of ourselves.

An additional problem is the lack of responsiveness to the varying needs and circumstance of learners. This applies, for instance, to individual differences in styles and pace of learning. It also applies to the way schools often restrict learning to a narrow daily time block and the requirement on learners to be available on a year-long basis, thus creating incompatibilities for important groups of learners who are subject to expectations not taken into account by such constraints.

Mainstream schools sometimes have difficulty in acknowledging other learning environments, other partners, or other systems of knowledge. They are furthermore limited — and are at great risk to rapidly grow almost totally out of touch with developments in society at large — in often continuing to rely heavily on teachers as the main source of knowledge and information. With the changes taking place in society, schools are in dire need to de-formalize and re-constitute themselves as components of learning environments that facilitate people's mobility across a wide range of options to participate in society at large as well as in their local communities.

Towards Open Learning Communities: The Teacher as Learner and the Learner as Teacher in Mediated Environments

A shift from the traditional conception of the teacher

Teaching is essential to the learning process. However, conceptions about teaching and teachers have lagged behind and, as a result, often run counter to the changes required in response to the situations discussed above. The emphasis of the teaching process has been

⁷ See for instance Sternberg, R. J. & Detterman, D. K. (Eds.) (1986). *What is intelligence? Contemporary viewpoints on its nature and definition*. Norwood, New Jersey: Ablex, and Sternberg, R. J. & Wagner, R. K. (Eds.) (1986). *Practical intelligence: Nature and origin of competence in the everyday world*. New York, NY: Cambridge University Press.

⁸ Gardner, H. (1983). *Frames of the Mind: The Theory of Multiple Intelligences*. New York: Basic Books.

centered around the teacher rather than the learner. In recent history, the tendency has been to view the teacher as an impersonal “expert” in the classroom whose only role is to transmit knowledge, facts, skills to the “empty” learner. This section attempts to challenge such limited conceptions of teaching and teachers by raising three basic questions: (1) what is the role of the teacher?; (2) who is the teacher?; (3) where does learning take place? We ask these questions today with a firm belief that in the future, because of the changing nature of learning (by some referred to as nothing less than a paradigm shift) the role of teaching and teachers will be more complex, more demanding and perhaps more essential than it already is.

What is the role of the teacher?

The teacher is someone who intervenes in the learning process of others. The process can be seen as providing prompts for engaging, stimulating, structuring, and encouraging learning in individuals and communities. While transmission of some types of knowledge and skills is part of this process and will continue to be important, the complexity of society and demands made on the problem-solving capacity of human beings will require that teaching be seen as fundamentally going beyond the transmission of information. In the world of the future, we envision that the teacher will be responsible for carrying out several inter-connected roles, as briefly described below.

- *Facilitation*

Facilitating learning entails building, accessing and validating a variety of activities, frameworks, information, and experiences for the learner to connect to. It should be clarified that facilitation implies more than simply providing access to new information or technologies; rather, it involves enabling understanding and creating meaning. This means raising the capacity of learners to ask questions rather than focusing on the provision of answers to predetermined questions. The teacher must challenge the thoughts and ideas of learners and stimulate them to engage in critical thinking and self-reflection. Essential to the process of facilitation is the ability of the teacher to link the appropriate set of interactions with the individual learning styles, interests and experiences of each learner as well as with the profiles of the communities that the learners perceive themselves as being part of.

- *Curriculum Innovation*

Centralized curricula around the world have often been unable to take into account the rich diversity in society and suffered from lack of imagination, flexibility and relevance. The result is that many learners find themselves “lost” in the learning process. Given the broad range of learning styles, needs, interests, backgrounds, and aspirations of learners, teachers must adapt and develop new curricular approaches, content and language to ensure that curricula are, on one level, linked to the daily life of the learner but, on another level, push the learners to

explore beyond the mundane aspects of their daily lives into undiscovered possibilities. The movement towards decentralization provides an opportunity for allowing teachers greater control over the curricula. However, with curriculum innovation, there must be greater efforts to conduct decentralized and participatory field research in order to understand the strengths and weaknesses of different strategies. Engaging in such research allows teachers to interact constructively and flexibly with the curriculum on a continual basis.

- *Connection of Learners and Communities*

While learning is an individualized effort, it is also a social activity. Teaching must be conceived of in terms of a larger social exercise of connecting learners (and, in the process, building communities) to each other and to the world around them. The process of connecting learners involves creating dialogue among diverse groups of learners that allow them to understand and appreciate the differences as well as the similarities that bond us as human beings. This means that teachers must be committed to understanding their learners and the communities that they come from. As part of this on-going process, they must also be willing to question their own internal biases and stereotypes.

- *Complementing/Supplementing Other Channels*

In addition to the traditional teacher, many other additional “channels” currently exist and are emerging, such as textbooks, newspapers, and magazines, educational radio or TV broadcasts, computers, audio or video tapes, the surrounding physical and human environment, libraries, specialized work areas such as to perform science experiments or for creative expression. Teaching becomes a process of integrating these resources so that they complement, supplement and enhance each other. This demands a sensitivity to the inherent strengths and weaknesses of each of the channels and how they satisfy to different styles of learning and different types of content. Teachers can also play a role in introducing these new media into communities where there is often fear or resistance to change.

- *Motivational Support*

The teacher must play a critical role in providing motivational support through constructive feedback and encouragement to the learner, responding to a broad range of motivational needs that vary over time and across learners. Learning is a process that is filled with success and failure — oftentimes involving great struggle and perseverance on the part of the learner. In many cases, failure can lead to great disappointment and withdrawal. However, if well managed, failure can also be turned into an important prompt to learning and thus can become the basis for success. It is the role of the teacher to provide positive inspiration at critical junctures of the learning process to ensure that learners stick with the laborious task of learning. However, the teacher should not take on this role in isolation, but rather seek to

build a learning community in which other learners provide motivational support to each other as well.

- *Learning*

A good teacher is a continual learner. In order to be effective, the teacher must remain connected with changing societal frames of reference (economic, cultural, political, social, technological, etc.) as well as with changing needs and interests of learners. They must be able to learn from their environment. But more importantly, they must be able to learn from their learners. This involves constantly trying to understand how learners react to, interpret and create meaning from different activities. It also involves a willingness to experiment with and adapt new approaches. In addition, the process of teaching involves modeling a love of learning. This love is something that one cannot fake. If the teacher demonstrates a dedication to learning, there is a high probability that the learners will “catch” that spirit of learning.

Who is a “teacher”?

We are all teachers just as we are all learners. The implications of the discussion in the previous sections points to a situation in which teaching can no longer be considered the sole jurisdiction or responsibility of the traditional classroom teacher. The teacher in the institution we call ‘schools’ still has an important role to play in supporting the learning process. However, we must seek to break down the barriers that have supported the historical isolation of teachers in schools from other “teachers” in society. In order for continuous learning to occur, the responsibility for teaching must be distributed and integrated with other institutions and individuals in throughout society. We thus posit three broad categories of “teachers”:

1) *Human beings*

This category includes the teacher in the classroom. But it also includes a wider range of individuals in society who are informally called upon to play equally important roles in complementing/supplementing the classroom teacher. These “teachers” build alternative learning environments and mediate access to diverse and valuable bodies of knowledge, traditions, information, skills, experiences, etc. The profound teaching contributions made by such groups as parents, family members, friends; community and religious leaders; literacy, community health, agricultural extension workers; tutors in different distance learning settings; journalists, artists, actors, musicians; media people (program producers, editors); and, artisans, craftsmen, farmers, traders, should be validated. In addition, we should recognize that learners are oftentimes teachers as they are called upon in many occasions to contribute to the learning of others.

2) *Media*

The “teacher” should also be seen as including a variety of media for the learner to connect to. Such media-constructed environments include those that are built around technology and take the form of print, television, radio, computers, etc. It also includes learning that is prompted by socio-cultural activities such as community service activities, meditation/prayer, internships/apprenticeships, etc. In addition, one cannot overlook the learning that takes place when one is able to connect with the natural environment. We must clarify though that while the human “teacher” will be a medium among the other media, the human teacher is still distinct from these other media with roles and attributes that cannot be substituted by them, particularly in the sense that only the human teacher is capable of engaging in learning him or herself.

3) *Life experience*

Finally, we are also taught by life experiences. This includes spontaneous processes such as love and death, that cannot be easily structured or planned in a conscious way. It also includes processes that are determined, at least to an extent, by choice or by the dynamics of the human environment the individual is part of. It is thus a crucial task of human as well as mediated teachers to connect learners to such important channels of learning, helping them to reflect on and value their experience, and to integrate life experience with the curriculum.

Where does learning take place?

Learning is a natural human process that occurs wherever human beings interact with each other and with their environments. Much of society’s effort to create the conditions for learning concentrate on the school system. However, learning can take place in formal as well as informal settings. It is not uncommon that some of the best instances of learning occur outside a formal setting as the learners tend to be more at ease and learning tends to be more contextualized within a relevant socio-cultural setting. For learning both within and outside the formal context to become optimally effective, it is thus important that artificial barriers between the two environments be reduced. Different media can play an important role in bridging the gap.

Teacher Education: The Learner/Teacher and Teacher/Learner in a Mediated Learning Environment

To this point, we have focused our discussion around the *ends* of education exploring implications and demands for learning in the context of a changing world and with it the need to incorporate an expanded view of teaching, the teacher and the spaces where learning occurs.

Inherent in the discussion has been a re-discovery of the duality of learning and teaching — the teachers must be learners (“teacher/learner”) and the learners must be teachers (“learner/teacher”). This is an essential element of the idea of open learning communities. Recognizing this duality and supporting it requires that we reformulate many existing (and outdated) institutions, approaches and processes which were conceptualized along linear roles and relationships. At this juncture then, it is appropriate to shift the discussion to the *means*. Rather than placing all of our hope on blind chance, how do we actively facilitate this shift in thinking about learning and teaching?

The area of teacher education provides a natural starting point for initiating this process of change. However, as we will highlight hereafter, it should be clear from the onset that teacher education is an integrated part of a broader conception encompassing the education of both learners *and* teachers for their new roles in open learning communities. In this section, then, we will discuss points of intervention into teacher education, particularly focusing on how information and communication technologies can be used to facilitate the process of change. But first it is necessary to reframe a few key conceptions around teacher education. The emergence of new ICTs provides an opportunity and a necessity for pursuing this exercise.

- *The distinction between pre-service and in-service education is no longer a useful one.*

This is particularly the case if we begin to conceive of teacher education in terms of a more continuous and fluid process. In this context, pre-service teacher education is best to be seen as a preparation not only for a pre-determined role as teacher but particularly also for effective interaction with a continued learning-teaching process. The new ICTs help negotiate a hybridization between formal and distance education so that face-to-face teaching is no longer only for the pre-service education and distance education is no longer only reserved for in-service education. Throughout the teacher education process, there should be a strong integration of both face-to-face and distance learning approaches.

- *Distance education is no longer a valid category.*

Perraton⁹ (1986) defines distance education as “an educational process in which a significant proportion of the teaching is conducted by someone removed in space and time from the learner.” However, such a definition begins to rapidly lose its meaning if we situate it within the broader construct of learning and teaching discussed previously. The more it becomes an established notion that the teacher engages in learning and the learner is a teaching agent, the less relevant it becomes to focus on the separation in space and time of the two roles. The

⁹ Perraton, H. (Ed.) (1986). *Distance education: An economic and educational assessment of its potential for Africa*. Washington, D.C.: World Bank

relationship between teaching and learning is fundamentally a dialectical one, based on a partnership between human beings to jointly create meaning¹⁰. This partnership is no longer solely dependent on the physical proximity of its constituent members, nor is its quality necessarily determined by it. Separation in space and time is a mere matter of option, in many cases based on convenience or appropriateness in context rather than sheer necessity. What matters, and what needs to be validated, is simply the quality of the dialogue between partners — “teachers” and “learners” in the traditional sense of the word, but also other members of the learning community.

- *A corresponding “learner education” is required.*

“Teacher/learners”, as they emerge from their traditional roles, must now first of all learn to become good learners. Being a good learner is not an easy task — it requires a great deal of discipline, patience, resourcefulness, inquisitiveness, open-mindedness, creativity and flexibility. This implies that teacher education must put greater emphasis on developing in “teacher/learners” the skills required to become better learners. In addition to encouraging teachers to become learners, teacher education must also support the process of “learner/teachers” in becoming teachers, both in terms of how they can teach each other and how they can teach the teacher. Thus, teacher education may seek to involve “learner/teachers” in parts of the process.

- *The new ICTs must not be viewed as replacing the human element in teacher education.*

There is increased frustration with the existing process of teacher education. ICTs are sometimes seen as a means of “fixing” this problem, particularly as they allow bypassing — or doing away altogether with — the assumed weak link, the traditional teacher trainer. This view, however, is erroneous. It was argued above that, in a context of different media, including the human being as one of them, the most striking characteristic which distinguishes the human medium from non-human ones, is the capacity to learn. “Teacher/learners” can thus best be prepared for their new roles in an environment which models the behaviours they are expected to acquire. Such an environment should therefore be profoundly human and humanizing and technologies need to be incorporated in it so as to enhance, rather than to detract from, this human aspect.

¹⁰ See for instance: Dervin, B. (1981). Mass communication: Changing conceptions of the audience. In R. E. Rice & W. J. Paisley (Eds.), *Public communication campaigns*. Beverly Hills, CA: Sage; Chiew, S. F. & Mayo J. K. (1995). The conceptual foundations of multichannel learning. In S. Anzalone (Ed.), *Multichannel learning: Connecting all to education*. Washington, D.C.: Education Development Center; Visser, J. (1995). Can new technologies lower the barriers to quality education for all? In S. Anzalone (Ed.), *Multichannel learning: Connecting all to education*. Washington, D.C.: Education Development Center.

Points of intervention in teacher education

Many attempts at improving the quality and motivation of “teacher/learners” through teacher training schemes have resulted in disappointment. Evaluations point, among other weaknesses, to the cascade model and its inherent transmission loss as well as to the gap between what is learned in the training situation and the realities of the field. The use of information and communication technologies within a distance learning context is often advocated as a way to overcome such weaknesses. Excitement has been generated around new ICTs as it is assumed that they can ‘bring the best expert directly to the teacher’ and facilitate two-way communication between the teacher and learner. Unfortunately, these are very narrow applications of the ICTs and we do not foresee them to result in any significant shifts in learning and teaching as they are simply extensions of existing approaches and processes. These “benefits” only serve to reinforce the teacher-over-learner hierarchies. However, the ICTs, if properly applied, possess the ability to unleash revolutionary changes in the field of teacher education. We suggest the following focal points for application of the new ICTs to teacher education.

- *Participatory teacher education*

Teacher education should be geared towards building a link between the various “teacher/learners” in society. Selected joint training sessions may be organized to do this with ICTs being utilized to facilitate greater communication, collaboration and reflection among the various partners. Initial sessions could start with discussions on how to work together, sharing of roles, and ensuring overlap (for reinforced learning). Such a process of dialogue should be geared towards discovering a basis for partnership in building open learning communities i.e., identifying strengths and weaknesses of each partner, formulating an understanding of the needs and interests of various learners, negotiating points of compromise, and team building. More importantly, it should be focused on developing a shared consensus around learning and how it relates to broader objectives of social change and development.

In addition, the ICTs provide an interesting opportunity for involving “learner/teachers” in selected teacher education activities. They can play a role in facilitating increased communication and sharing between “teacher/learners” and “learner/teachers.” The ICTs potentially provide a way for not only the “learner/teacher” to understand the “teacher/learner” better but also for the “teacher/learner” to understand the “learner/teacher” and for the “learner/teachers” to understand each other, and sometimes even themselves, better.

- *Flexible training for specific needs of teachers*

One of the strengths of the ICTs is that they facilitate moving away from generic teacher education models with relatively little relevance to the lives and daily problems of the

“teacher/learner.” The ICTs allow for the development of specific training models that are sensitive to the different needs, working conditions, learning styles, language and backgrounds of individual “teacher/learners.” Such individually-tailored approaches of teacher education are better geared towards addressing issues of motivation and morale. However, this should not be taken to mean that a group of centralized training designers try to design hundreds of specialized training programs, but rather that they should utilize the ICTs to support a process in which “teacher/learners” take on a greater role in generating and designing their own training programs.

- *Teacher education conceived of as on-going and in the learning environment*

The ICTs allow the potential for teacher education to be moved out of centralized training institutions and into the “teacher/learner’s” own working environment. In addition, they open up the opportunity to think of teacher education as a career-long career-wide activity rather than as a pre-service phase with bouts of in-service training merely for refresher purposes. Such an emphasis on on-going training is essential to allowing the “teacher/learners” to continually reflect on critical aspects of their own teaching as well as critical aspects of their own learning.

- *Overcoming the dichotomy between subject matter and pedagogy/andragogy*

The ICTs allow us to rethink the content of teacher education. Traditionally there has been an artificial dichotomy between mastery of subject matter and pedagogical/andragogical skills, sometimes with a tendency for teacher education to emphasize the subject matter aspect of the content. Teacher education content should be re-oriented to focus on learning and learners with subject matter and pedagogical/andragogical elements integrated around this focus. In addition, the ICTs should be used to make teacher education more consistent with the pedagogical/andragogical concerns being advocated, such as active learning, critical thinking, collaborative processes and creativity.

- *Interacting with different media*

Noting the expanding role the new media are already playing in the provision of education and cognizant of how this role will undoubtedly expand, it is critical to recognize the importance of media literacy among “teacher/learners.” Such media literacy requires a strong understanding of the strengths and limitations of each medium and familiarity with strategies to reinforce the effect one medium can have on learning through the use of other media. However, the idea of media literacy should be conceived beyond the glitzy hi-tech schemes available on the market. “Old” technologies such as print, radio, television will no doubt continue to make great contributions to the development of open learning environments world-wide, particularly if integrated in supporting community contexts. Furthermore, the “teacher/learner” should be

encouraged venture beyond them and also make improved use of relatively unexplored media of popular expression such as puppet shows, local dances and music. Teacher education should ensure that teachers interact and experiment with these various media and creatively reflect upon how they can best be used in different learning environments. This should be more than a mere theoretical exercise and actually involve hands-on experience.

Taking on the Challenge

Technology in and of itself does not change the world. Human beings do. They do so by using technologies in creative and critical ways, opening up important new opportunities to respond to existing and emerging problems. The challenge is there to be met.

In this paper we have argued that learning and teaching need to change fundamentally. We have also argued that a good starting point to provoke such change is by re-conceptualizing the roles of teachers and learners. Technology has been posited as an opportunity to create processes that encourage teachers to become learners and learners to become teachers. This is a major shift, the realization of which entails overcoming equally major obstacles.

The question that remains is how to facilitate this shift. The complexity of the situation does not allow for simple blueprint approaches. However, we have two powerful tools available. First and foremost is our capacity to learn. Second is the power of the ICTs themselves to enhance such learning. We must thus seek to take advantage of these tools by building, in our own environment, similar roles and relationships as the ones advocated in this paper. This calls for a commitment to view ourselves not only as experts but also as learners who must, while implementing change, actively engage in a process of continuous interaction, reflection, redefinition of positions and informed risk taking. The starting point for effective change thus lies in our willingness to change ourselves.