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ABSTRACT

Educational technology has changed the definition of classroom in terms of location, size, composition, learning environment, and teacher role. Educational technology in developing nations helps accommodate people in poor and rural areas. Distance education through open universities has increased in several countries. It includes two-way communication media that allow for direct interactions between teachers and remote students. It conquers restraints imposed on conventional education by time and space, and offers higher quality instructional design. Distance education can produce significant cost savings by allowing teachers to optimize existing resources. For example, teachers can use the Internet to gather information, and colleges can hold distance education in existing settings rather than constructing new buildings and classrooms. Distance education provides continuing education to practicing teachers in all settings. Multi-mode approaches using distance and conventional methods offer the most comprehensive teacher training. Distance education can address the shortcomings of conventional education (e.g., high costs, need for physical infrastructures, and need for full-time teachers). Conventional education can address the impersonality of distance education by providing practical training in actual schools and institutional summer schools. Recent educational reform movements in Asia have emphasized improved inservice and preservice training via distance education and nonformal education. Such application of technology to education and training is critical to economic wellbeing, particularly in Asia's developing countries. (SM)

# REVITALIZING TEACHER EDUCATION THROUGH DISTANCE EDUCATION

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## I. INTRODUCTION

1 Change, wrenching change, has marked the 80s and the 90s. There also have been mind-boggling developments in science and technology, genetics engineering and medicine, chemical industry, etc. Test tube babies. Transplanted hearts and organs. The Pathfinder space probe in Mars. Possible extra terrestrial beings in some planet. The possibilities are so vast and mind-boggling, it is difficult to say where knowledge begins and ends. Certainly these are new times. The new way to the future is the ability to appreciate the new learning environment beyond the four-walled classroom; and to explore space and high-technology for common people - a feat never thought possible in the past. The learning groups are not of the same age; housewives are learning music with children. The changes to take place in 2001 and beyond will not be simply wrenching; but totally new. Wrenching means to uproot from what is already there; the changes in the new information technology age will start from new platforms of new ways of dealing with this planet, but with the universe; of conceptualizing not only about man, but of possible other beings, either created in test tubes or from other galaxies; not only about civilization as we know it but of entirely new cultures and probes into alien futures.

2 The logic would be that, anticipating these vast qualitative changes in our thinking and action, we would be re-engineering our ways of solving problems and making decisions. This is however farthest from what is happening in education, particularly in developing countries. Indeed, in one particular area, one is dismayed by the little progress that has been made in the field of conventional educational methodologies. It almost appears to be at a standstill despite the tremendous resources poured into formal education. Formal education is uniform in structure and content with a heavy emphasis on cognitive objectives. In contrast, real society is heterogenous and varied. In the conventional sense, education was equated to schooling or formal classroom instruction, with defined curriculum, fixed timetable, defined age group, defined criteria for admission and completion, and standards and norms which assume that all children learn the same way at the same pace. However, new learning theories postulate that there are individual differences; each individual is different from the other in terms of personality, attitude, experience, ability to learn, motivation and interest, and these theories have also influenced teacher education. Thus it is difficult to acquire behavioral (including affective and psychomotor) skills for such a rapidly changing society in a closed traditional institution such as a school.

3 The concept of institution based formal education appeals mostly to people who can afford the cost, time, and opportunity costs. The traditional practice was always one of the formality, of protocol and procedure. In today's new world however, much of life is informal, done spontaneously and creatively, and with some amount of calculated risk. The great events leading to 2001 bear this out: the huge achievements in computer software led by the college dropout Bill Gates; the claim that a 14-year old boy has discovered the solution to the 2000 millenium computer bug; and building an entirely new cybercity in Kuala Lumpur. Indeed the entire scenario is changing. People would like to continue their learning throughout life; they would like to change their careers and interests through mid-life; and with the emergence of electronic media and

information highway, the classroom is no longer limited to the school - it has shifted to the house, office, car, even gyms and restaurants. The nature of the classroom has changed. Emergence of electronics has changed the definition of classroom in terms of its location, size, composition, learning environment, and the role of the teacher or facilitator in this classroom. In today's classroom scenario, there could be people of different groups in the same class; coming from different professions, socioeconomic classes, with varied aspirations, and different learning paces. The new classroom is defined by a skill, not by age group. For example, in a computer classroom, one can see that there are different learners: there could be businessmen, housewives, doctors, students, salesmen, etc. -- all of them learning one skill. Computer skills cut across all sectors; computer applications are being taught in mathematics, science, business, home economics, engineering, medical science. It is more application-oriented. Change, rapid and qualitative change, is the reality of today's new environment.

## II. REVITALIZATION OF EDUCATION

4 Which brings us to the new role of media today. Up to these times, media have focused on either working as government vehicle for its propaganda or if in the private sector, in providing entertainment and making money. There is a new responsibility in the new environment, responsibility to educate people; not simply provide sponsored information, entertainment or commercials. Likewise, media cannot be limited to urban areas which are occupied by only 30 percent of population; ignoring the 70 percent in the countryside. Media's challenge is: how to service 70 percent of rural area specially disadvantaged? There are several solutions, not a single approach. But if we are to maximize today's great achievements in computer and communications breakthroughs, then we can focus on optimizing total media to reach out to the poorest of the poor.

5 There are some bedrock lessons we have learnt from traditional education. The issue is: how and what do I want students to learn? And where? The effectiveness of technology-based open learning is now a non-issue; concentrate on designing the learning experience, and not on testing the technology. There is more than enough technology around now to allow you to teach in whatever way you choose. The learner learns. No other principle holds as true yesterday, today and tomorrow. Which means help the learner to learn what he or she wants to learn. Whether face to face, or through a medium, or tri-media material - the learner's motivation to learn is the key. One function of media is to focus on generating the motivation to learn. This is a key role of media: the building of awareness, the plunging beneath the iceberg to bring up the reality, whether it is for the purpose of literacy or poverty alleviation or women upliftment or environmental protection. Media should explain the rationale for education; create motivation on the part of the learner to learn; and focus on what to learn. In sum, it is becoming the new generation's prime vehicle for the marketing of knowledge, skills, even values and attitudes. Knowledge is exploding; you need to absorb what you need to absorb. There is no common curriculum. Learning to learn has become more important than mastery of content or methods of teaching because contents are changing and expanding so swiftly. What is one to learn about the mastery of a given subject? Rather, one must know how to analyze new developments, place them in their proper context, visualize the changes in their contextual environment, and relate them to one's life. It boils down to the core competencies of solving problems and making decisions. Of society's various agents of change, the biggest challenges will confront that of the teacher. By tradition, competence and training, the teacher has vaulted from the old role of the four-walled classroom to today's free

environment of total media and participatory learning. The teacher no longer can simply teach top-down and one-way. The tremendous flow and variety of information reaching children and adults today will force the teacher to become an intelligent screening agent; a facilitator and promoter; and a key to unravelling facts and insights for the learner from an explosion of information. The core competencies today's teachers must acquire will enable the teacher to reduce contingencies and facilitating learners in establishing consistencies and patterns where none seem to exist. Of what use are the avalanche of knowledge and skills unless one can use them to make decisions and appropriate choices. This is what life is all about. Choices and decisions. All the information available which help make correct choices and decisions should be made available to the learner and the teacher's role is of a facilitator. If he sees options available to him which will reduce constraints on the part of the learner and open up opportunities, he must have capabilities and competencies to utilize them. Life is always the pursuit of opportunities which lead to development and happiness.

6 In practical terms, what end product are we talking about? We are talking about a person strong in spiritual and moral values in which there is balanced growth of personality through training of the spirit, intellect, rational self, feelings and bodily sense of men and women. A person literate in communication essentially in functional literacy so that whatever his formal grade schooling, he can study and learn on his own using books, radio-TV, group discussions, etc. Needless to say, with the new education emerging from electronics and information sciences, we can hope for such a person to be technically literate too; mathematically knowledgeable; socially literate; and enable him to possess practical skills to earn a livelihood, become productive, practice good citizenship, and foster respect for country and its laws.

## III. DISTANCE EDUCATION

7. The silent revolution in education that was taking place all over the world in the 70s and 80s is now breaking out in the open with the blooming of information technology and educational communications. It is the emergence of distance education as an alternative system of education. Emergence of distance education can be classified in three generations. The first generation distance education used predominantly a single technology and lacked in direct student interaction with the teacher originating the instruction. Second generation distance education is characterized by a deliberately integrated multiple-media approach. The third generation distance education is based on two-way communication media which allow for direct interaction between the teacher who originates the instruction and the remote student. The area of education which is considered to be fastest growing today is distance education. On a personal note, I remember that when I did the Asian Development Bank's first Staff Paper on distance education in 1985, hardly anyone had thought of using distance education as a development strategy for human development. The Bank followed this up with a Regional Seminar on Distance Education which resulted in Asia's first comprehensive 2-volume book on Distance Education in 1987. Today, it is the reverse. It is now accepted that distance education is a powerful means to utilize telecommunications to disseminate learning experiences, ideas and information to produce two-way exchanges between the trainer and the teacher and to bridge time and space limitations.

8. Technologies are generally flexible and hence, interchangeable in education and training, i.e. what can be achieved educationally through one technology can usually be

achieved through any other technology, given sufficient time, imagination, and resources. Each technology can be used in a wide variety of ways. Thus, the absence or non-availability of a particular technology does not necessarily prevent learning goals from being achieved. Thus imaginative use of communication technology can initiate a process for developing total education and training mechanisms in the 21st century. The question is not whether developing countries can afford the peaceful uses of outer space through the use of satellite technology, in particular, the strengthening of basic services. Rather, it is whether they can afford to ignore them. Distance education can conquer the restraints imposed on conventional modes of education by time and space. Distance education, based on a multi-media approach, is an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner. One of the great contributions of distance education institutions has been to raise the quality of instructional design, resulting in extremely well designed learning materials. This is a result of a great deal of preparation time and teamwork. High quality teaching materials are particularly important where students have a variety of educational backgrounds and experience of study, and are especially important where entry to course is open to all. In recent years, distance education through the establishment of open universities has been increasing in several countries--developed and developing, socialist and non-socialist. In Asia, a number of countries have started open universities during the last decade. Open Universities are already established in Bangladesh, Fiji, India, Indonesia, Malaysia, Pakistan, Sri Lanka and Thailand. However, the use of distance education in teacher education is still evolving. This is where we need to pay attention more closely because the advancement in communication technologies has changed the role of a classroom teacher. In addition, without detracting from the achievements and usefulness of the formal schooling system, the overriding concern is how to promote self-reliance as a strategy for education--especially for the teachers. Such liberation of teacher will ensure that once equipped with self-learning capabilities, teachers will become their own best trainers and will not be dependent upon the provision of formal institution based pre- and in-service training. Liberation of the learner (in this case, the teacher) is the ultimate mission, and self-reliance the strategy for teacher education.

9 The role of the teacher has always been attached to the classroom. Restricted to the confines of the four walls. The strategy of complementing conventional system by distance education will result in economies in many ways: by optimizing use of existing facilities; thereby enlarging the coverage; enriching the system as the teacher will have access to knowledge through the internet. In the past, if there were no libraries, the teacher could not learn; learning was limited to books; but with internet access to worldwide knowledge, the possibilities are vast. If teachers were organized in teams and given release time to create high quality learning materials, in the form of print and video cassettes, supported by a synchronous tutoring computer conferencing, both on-campus and distance, students could equally benefit. Teaching staff would be freed from lecturing and group seminars on a regular basis, and could give more time to individual or group tutoring on time. It will result in enriched curriculum, updating with the latest information, introduction of new skills, making learning not limited to classroom but across boundaries of classroom, and help optimize use of one's life and expectations. In the new environment, teachers can earn more by tutoring students and parents using information technology.

10 Now, let us take another view. Examine the distance education classroom. This classroom starts with optimization of use of available resources; in effect, you don't have to create a classroom. If there is a building or room available, factory shop, community assembly hall, or sport gymnasium, or even the car stereo, garage, radio or TV set, these can all be the classroom setting for distance education. Not only will distance education expand classrooms on-the-air or in substitute places (farm, factory, home, etc.), it will also expand the cadre of teachers. Indeed, the teacher need no longer be the traditionally-trained teacher. This teacher can come from the factory, or be an engineer, or a doctor, or a housewife, or an industrial worker. They are the ones who can work as teachers or as HRD specialists. Using electronic media and information technology, this classroom could be spread over the province, country or beyond boundaries of country. A TV lesson can be available in the house, school, province, country and beyond the country all at the same time. Take the Pathfinder expedition in Mars. The Americans are beaming new information on the planet Mars to TV stations throughout the world, and ordinary households now have access to such outstanding scientific developments. Who would have imagined this possible in the last 5 or even 3 years? There is yet another dimension to distance education. The composition of students can be most varied ever. The focus is on knowledge and skills they want to learn. This makes the distance education curriculum complex, yet flexible. The foundation is flexibility so that they can change from one skill to another; one field to another.

11 What does this all mean? It means that while we may have global concepts of distance education, this has to be utilized for the revitalization of education. Which brings us to the education and training of the key actor of teaching and education, the teacher. We have made countless needs assessments of teachers, and repeatedly we find that the teacher needs a good knowledge of learning theories, and deep appreciation for individual differences of learners; good command over the area of his specialization (competence); skills to use electronic media not only as an individual talent but also in combination with other resources in the institution to optimize use and reduce cost; ability to use the computer, tape recorder, film equipment, the camera, and eventually of internet accessibility. In hard terms, what does this mean? It means not putting more buildings; nor big capital investment; but how to optimize existing resources. Teacher training really needs to be overhauled and remodeled; it is 50 years old. Teacher training institutions are the only institutions which are disconnected with everything; they do not talk to anyone. They are cold institutions, not sensitive to their clientele or the requirements of the sector they are supposed to service.

## IV. REVITALIZING TEACHER EDUCATION

12. Within the context of teacher education, distance learning offers a wide array of programs--the continuing education of school teachers to become supervisors, the upgrading of teaching techniques, of teaching skills, of subject knowledge from those of information specialists up to those of scientists and engineers. In continuing education, which takes place largely outside the formal school and university system, distance education is more widely and boldly used than in the formal system. It is my hope that this use of distance education in some educational institutions for their extramural clients, can be adopted by the formal system and help instigate the restructuring of teachers education that it urgently needs. Continuing education programs for teachers can be strengthened through the effective use of distance education to balance inequalities between trained and untrained, as well as urban and rural teachers. It is much less expensive than formal system to organize 'second chance' training for

those who left formal education after completing pre-service education and want to upgrade their education in order to compete for better jobs. Continuing education programs dealing with curricular changes and education campaigns for large audiences can benefit from the use of powerful mass media. Distance education has an important role to play in implementing curriculum changes. When curriculum changes are introduced in the school system, specific teacher training programs may be needed for considerable numbers of teachers in a very short time. An effective way of doing this is through distance education. Finally, in modern society, people tend to develop competence in more than one field and to change their occupation several times during their life span. Continuing education through distance learning is an optimal way of developing new competencies on the part of teachers.

13. Nothing happens in education unless it happens in the classroom. Of what use are sophisticated planning systems in central headquarters or policy pronouncements or ambitious five-year plans, if, in the end, they are not articulated in the classroom? It is in the classroom that education really takes place. Yet if you visit several classrooms you will note clearly how classrooms differ from each other in their 'feel'. In one classroom, you may find students engaged in learning activities, interacting with each other and with the teacher and instructional materials. The atmosphere is full of enthusiasm: the teacher and the students are zestful and exude confidence in what they are doing. The environment is so stimulating that every moment is highly satisfying for the teacher and students. In a second classroom, the teacher may be speaking and the students simply listening. No interaction is taking place. There is only one-way communication. The brooding discontent of the students is palpable. The teacher is perhaps hiding his lack of a sense of direction behind a cloaked authority. In the third classroom, one may find confusion. The classroom is marked by neither joy nor despair, but by hollow ritual. These are different learning environments in the world of the classroom: where learning either takes place or not. The classroom is a receptacle for education inputs, such as the students, the teacher, the curriculum, and the curricular materials. But it is the teacher who plays the pivotal role. If the teacher is not competent or qualified, or does not have positive attitudes towards the students of the teaching profession, or does not have the appropriate skills to handle the curriculum in terms of instruction methodologies, all these inputs could be wasted. An appropriately trained and qualified teacher is a precondition for the optimum use of all the inputs provided in the classroom, including the learner's time. In brief one can indeed say that nothing happens in the classroom unless it first happens with the teacher. Clear objectives, good structuring of learning materials, relevance to learners' needs, etc., apply to the use of any technology for teaching and if these principles are ignored, then the teaching will fail, even if the unique characteristics of the medium are stylishly exploited. Good teaching may overcome a bad choice in the use of technology but technology will never save bad teaching; usually it makes it worse. All technologies have their strengths and weaknesses, therefore, need to be used imaginatively. Teachers and instructors need training not just in the choice and use of appropriate technologies, but more fundamentally, in how people learn, and in instructional design. Lack of appropriate training is the biggest barrier to the use of technology in teacher training.

14. In recent times, there have been several movements sweeping through the education systems of Asian countries. These include the move towards universalisation of primary education, continuing education, education for the world of work, the restructuring of primary and secondary education, the emphasis on communication technology, science and

technical education, and - to my mind the most critical quality input - increasing attention on teacher training and distance education. To be specific, the reforms in pre-service and in-service teacher education now range across laterally and upward and downward vertically. At the top, changes in policy-formulation and curriculum development now involve more participation by teachers and are not just left to the curriculum experts. The most visible changes are in the use of open learning systems in the training of new teachers, especially of female teachers in remote rural areas, and in the retraining of teachers already in service. Open learning systems allow the maximum exposure of teachers to educational and communication technologies, and offer various options to meet different needs to cope with the constraints and limitations of conventional training systems. These systems take the form of distance education and non-formal education. A mix of these systems has also been introduced in the form of 'training outposts' in some countries in remote areas where a nucleus force of teachers, fully equipped with instructional materials and tri-media facilities, encamp themselves for a week or two using mobile training vans or even animal conveyances. Indeed, where camels and horses were used in merchants' caravan trails in huge deserts in the past to distribute goods and food, today it is information technology and education communications which are bridging villages and municipalities, and pole-vaulting teachers to new heights of knowledge and skills. Such new knowledge and skills are now available from around the world through experts and specialists captured on multi-media in stimulating settings aimed at motivating learning and training. In this way, the best available experts are brought to rural areas. These are sometimes supplemented by mass media programmes on radio and television.

15. Various strategies need to be developed to make teacher training a continuous rather than a one-shot approach. The use of open learning systems to supplement conventional training systems is to be encouraged. These offer a multi-mode approach which allows for the production of more teachers, and for the strengthening of different programmes and delivery systems. Conventional training is constrained by its high costs, its need for physical infrastructures and full-time trainers and student-teachers. These inadequacies can be supplemented by distance education and non-formal education techniques. Similarly, the impersonality of distance education can be lessened by features of the conventional system, for example by providing practical training in actual school settings and institutional summer schools.

16. Finally, we must now manage education, in particular, teacher education, in the new style of the 21st century. And that is management in a participatory, consultative, decentralized, and community-based style. Stakeholders and beneficiaries must join in problem-evaluation and solving and in decision-making. Indeed, community participation and use of community resources in the classroom, whether four-walled or via tri-media or in the farm, in support of teacher upgrading is most urgent and vital. Community leaders can be invited to present real life situations in the classroom to support the teacher. Community support also needs to be encouraged in the organization of teacher activities including teacher resource centres, school conferences and teachers' seminars, all of which help to enhance the image and status of the teaching profession in the community. It is my view that technology could and should be used a great deal more in education and training than it is, but I do not see it as a panacea. The value of technology is its ability to reach learners not well served by conventional educational institutions (rural teachers are one of such groups), to meet better the newly emerging educational needs of an information society, and to improve quality of learning.

I argue that the intelligent application of technology to education and training will be critical to economic well-being, particularly of in developing countries of Asia. Its value will be greatly increased when applied to the existing workforce.

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