Overcoming Obstacles in Building the Learning City: The Case of Brazil

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The history of formal learning offers examples of centers of excellence in both isolated non-urban settings and densely-populated metropolitan clusters, each providing an environment for work and study appropriate to its surroundings. There can be no doubt, however, that the new world of digital communications will permit the increasing democratization of access to knowledge and to the certification of competencies. If, in the past, there was a tendency for many to flock to cities to be among skilled professionals, to take advantage of the comforts of a consumer's marketplace, and to prosper amid the opportunities to innovate and to grow through the rich exchange of ideas, then the new information technologies will diminish whatever differences previously existed between towns and cities, between the periphery and the center.

I. The Importance of Cities for Capacity-Building

"Learning cities" are population centers, both large and small, which reflect the new values of the knowledge society—namely, that people constantly acquire and produce new information as an economic activity and as a form of leisure. They represent one of several regional development strategies, offering "a mix of resources," and serving as "incubators for the knowledge society." Possessing institutional structures featuring modern technologies and workers with cosmopolitan values, learning cities have in common several clearly identifiable characteristics:

- Explicit commitment to placing innovation and learning at the core of development;
- Priorities for lifelong learning, innovation, and the creative uses of information and communication technologies;
- Subtitles like: Cities Without Walls; Educational Cities; Ideopolis-Knowledge City Regions; Digital Cities; Digital Communities; Intelligent Communities; Information Cities; e-Cities.[1]

Although many such cities are small and hardly known outside of their local regions, several large metropolises have inaugurated activities which fall under the heading of learning cities, among them Seoul, Singapore, Tokyo, Hong Kong, Stockholm, San Francisco, Tallinn (Estonia), New York, Beijing and New Songdo City (Korea). But none of these large cities as yet gives free Internet access to all of its citizens.

What are the benefits to individuals in learning cities?

- "Acquisition of knowledge, skills and understanding…formally or informally;

- "Improved wages and employment opportunities."

And the benefits to institutions and society?

- "A more flexible and technologically up-to-date workforce;
- "Learning for competitiveness;
- "Partnerships of towns, cities and regions…collective learning…continuous exchange and flow of information about products, processes and work organizations…based on stability and trust."[2]

Brazil, a country which covers about half of the continent of South America and about half of its population, at the present time is the world's tenth largest economy, but it demonstrates a need for serious capacity-building. Almost at every step of the educational process we find results that fall short of the demands of a society in the knowledge era.

In 2007, PISA, the well-known OECD annual evaluation of the learning performance of 15-year-old students in a large group of countries, was revealing. In the area of Reading Comprehension ("understanding ambiguities, formulating hypotheses and critically evaluating prepared texts), while the students in Finland achieved the highest rating (over 80% did well on the test), those in Brazil were among the weakest (only 25% did well). Likewise, in a World Bank study in early 2008, evaluating young people in Latin America, 10-14 years of age enrolled in primary education, those from Brazil did extremely poorly.

- Of the 19 countries included in the study, Brazil ranked 15th (behind Bolivia, Peru, Paraguay and the Dominican Republic);
- The top-ranked countries: Chile, Jamaica, Argentina;
- Below Brazil: El Salvador, Honduras, Nicaragua, Guatemala;
- "Schooled Illiterates" – a term taken from another World Bank study of Brazilian children 7-14 years of age, and in school – 87% cannot read and write.[3]

The Brazilian Institute of Geography and Statistics earlier this year revealed that while in 1997 the Brazilian population had 5.8 years of formal schooling, in 2007 this figure rose to only 7.3 years.

Brazil invests less than it should in Research and Development, as shown in a recent OECD study:

- Average of the 29 countries of OECD: 2.4% of GNP
- Chile: 1.2% of GNP
- Brazil: 1% of GNP

In 2004, of 72,000 industrial companies in Brazil:

- 1.7% invested significantly in R & D
- But this small group grossed 30% more than its competitors, had greater profits, exported more, and paid better salaries

Of course, it is difficult to say with confidence whether the investment in R & D brought about the success, or whether the success permitted the investment.

Brazil currently has only 17% of its college students studying with engineering, science and mathematics as their major fields. A recent study of where Brazilians who had obtained doctoral degrees were working revealed that:

- In 2004 8,094 doctoral degrees were awarded (10th place in the world).
- But Brazil is only in 27th position (in relation to 1:100k population).
- Of the total of doctoral degrees in 2004, those in science/engineering (4726) represented 58.4%.
- Plan for 2010: 16,000 doctoral-degrees awarded annually
- Where do doctoral degree holders work: education (44%); public administration (43%); unaccounted for [unemployed? changed profession?] (13%).

There is a serious deficit of engineers in Brazil, both in total numbers graduating each year, as well as in relation to those graduating in all other academic fields, as this comparative chart demonstrates.

Deficit of Engineers in Brazil

Country	Annual Grads.	Grads/ % of Total
Brazil	41,491	5.6%
Germany	39,276	12.6%
Japan	130,986	19.7%
Korea	79,622	26%
Mexico	55,864	14.3%
United States	138,134	6.2%
United Kingdom	45,347	8.8%

The International Labor Organization of the United Nation predicts that the growth of renewable sources of energy will create 20 million new jobs around the world by 2030. 12 million alone will be in the area of ethanol, the biofuel made from sugar cane, corn and other renewable sources. Over the last three decades, Brazil has invested heavily in ethanol technology and now represents 53% of the world's ethanol trade, in addition to having as "flex-fuel vehicles" (running on ethanol, gasoline ou natural gas) 70% of its domestic automobiles. But for Brazil to meet its goal of tripling ethanol production in the coming years, it will need ever greater numbers of scientists and engineers.

Brazil now has the greatest number of workers in ethanol:

-- Brazil: 500,000
-- United States: 312,000
-- China: 266,000

-- Germany: 95,000
-- Spain: 10,000

But too few workers in the recycling of refuse:

-- China: 10,000,000
-- U.S. & Europe: 3,500,000
-- Brazil: 500,000.

Likewise, Brazil is far behind other countries in the percentage of its young people involved in higher education studies:

-- Brazil: 12% (5 million)
-- Chile: 30%
-- Argentina: 30%
-- United Kingdom: 40%
-- United States: 50%
-- Canada: 60%
-- South Korea: 85%

....considering the time it takes to build new campuses and train new faculty, distance learning is probably the principal solution to this problem of a shortage of skilled workers.

II. The Contributions of Distance Learning to Capacity-Building

Distance Education is at the center of the new approach to learning. As Arthur M. Harkins has observed, we can now consider that there are four generations of educational paradigms:

- Education 1.0 – Memorization of content
- Education 2.0 – Learning extended through access to the Web
- Education 3.0 – Permits that learners not only consume knowledge but produce it as well
- Education 4.0 – Supports the learner in the production of innovation.[4]

These new strategies for pedagogic and andragogic learning are reinforced by other factors which contribute to the ever-greater importance of distance learning:

- "High Cost of Driving Ignites Online Classes Boom" (*New York Times,* 11 July 2008). Gasoline goes to US$ 4.00. 80% of 15 million U.S. college students live off campus. Enrollments in online courses has grown between 50 and 114%.
- The State of Michigan, in April, 2006, made it a requirement, to obtain a high school diploma, to have the experience of taking at least one online course (*New York Times*, 30 July 2006).
- The advent of OERs, Open Educational Resources, seems to promise greater access to knowledge and information throughout the world, and to the re-use and re-purposing of

content; but it is difficult to predict at the present moment how this movement will truly fare.

There was good news in Brazil earlier this year when the results of the Ministry of Education's 2007 national-level exams testing the knowledge of first-year and graduating college students, yielded surprising data:

-- the students who studied through distance learning had better performances than those who studied in conventional classrooms;

-- among first year students: in 9 out of 13 academic areas tested, distance learners fared better than those who studied in conventional classrooms;

-- among graduating students: in 7 out of 13 academic areas, distance learners fared better than those who studied in conventional classrooms.

We must not forget that the different regions of Brazil have different socio-economic realities, and differing educational opportunities. There is a total of 2,300 institutions of higher education in the country. Three hundred are designated universities because they meet the requirement of instruction, research, and extension activities. The remainder are "university centers" or "faculties," in which instruction is the only activity. Twenty percent of the total of institutions are public (tuition-free); eighty percent are private (10% following religious orientation; 90% are for profit).

The types of delivery systems used are:

- Correspondence: 71.1%
- E-learning: 62.9%
- Television: 23.6%
- Video: 45.0%
- Satellite: 11.4%
- CD: 49.3%
- DVD: 37.1%
- Radio: 7.9%
- Teleconference: 12.9%
- Videoconference: 24.3%
- Cell phone: 12.9%
- Others: 10.7%

Largest subject areas studied in DL:

- Administration
- Pedagogy
- Language and Literature

There is strict regulation of distance learning activities in Brazil with regard to formal education (when a course leads to a diploma):

- The Ministry of Education – regulates higher education;
- State Governments – regulate secondary education and some post-secondary technological education;
- Municipal Governments regulate primary education.

ABED's Statistical Yearbook of 2008 showed that in 2007 207 institutions were authorized by the Ministry of Education for distance learning activities and that there were 972,000 post-secondary students enrolled in distance learning courses throughout the country.[5]

III. The Obstacles to the Proper Development of Distance Learning

Perhaps the principal obstacle to the growth and continued improvement of distance learning in Brazil is the highly conservative posture of the Ministry of Education in the process of authorizing institutions to initiate activities.[6] The Ministry is concerned with the quality of courses, especially those offered by private institutions, and there is some reason for this posture. At best we can attribute it to what can be called the "Greed Factor" – or diploma mills and other shady business tactics. At the ICDE 22nd World Conference in 2006, in Rio de Janeiro, Prof. Henrik Hansson, of the University of Stockholm, gave a most interesting plenary address: "Traps,Tricks and Survival Tactics – the Digital Learning Landscape," in which he talked about "false universities" and "false diplomas." He estimated that there were some 1,000 such institutions around the world. Although I am pleased to say that no evidence has yet appeared in Brazil of false universities, there are other "crimes," both of academic quality and those related to consumer issues, which are present and which represent serious obstacles.

For example, among the tricks for maximizing profits at the student's expense, practiced by some Brazilian distance learning institutions, we sometimes find:

- abridged versions of textbooks (150pp. > 50 pp.)
- printed material, sent to students for study, is lifted out of a manual for using a calulator
- tutors who are not subject specialists
- radically assymetric tutor-student ratio (1 : 500)
- not enough computers (or other equipment or books) at student support centers (sometimes called "pseudo-centers")
- "interdisciplinary exams" (the same test of 40 questions is given to students from five different courses)

As a Brazilian wit once observed: "The Brazilian is always fighting for the right to not obey the law." In the first semester of this year, there was reportedly a

billboard on a main boulevard in Belo Horizonte, a large Brazilian city, aggressively advertizing a distance learning institution with the following appeal to the pocketbook: “What is more important to you – quality or price?”

As a result of this environment, we are subject to excessive government regulations. Although the country’s Constitution (1988) gives universities autonomy in their academic and administrative practices, in the period 1995-2002 regulations were issued which made it practically impossible for universities to obtain permission to initiate distance learning activities. Even worse, insitutions both public and private were prohibited from accepting the credits and diplomas of students who had earned their degrees in other countries through distance education. With a change in government in 2002, new laws began to be issued which were less rigid and less confining. Nevertheless there remain legal and procedural obstacles which militate against innovation and creativity in distance learning, and which absolutely ignore institutional autonomy. For example:

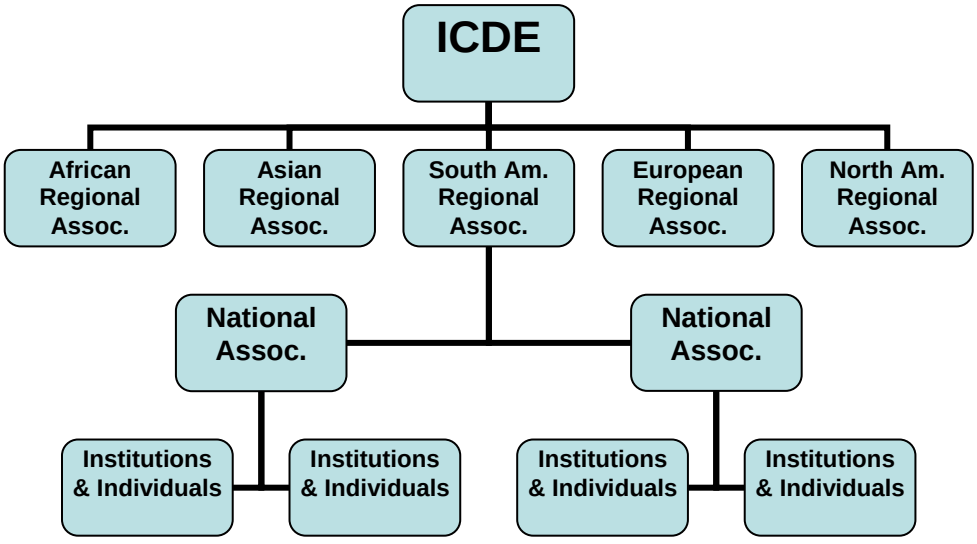
- only 20% of a course can be at a distance;
- centers for student support (which must be within 100 km of student residence);
- 10 computers and a physical library of books are required at student support centers, even when the course is very expensive and all students participating have computers at home;
- final examinations in a course must be face-to-face;
- excessive delay for obtaining approval from the Ministry (sometimes in excess of 24 months);
- Ministry evaluators (4,000 educators make up the eligible cohort)) sometimes know little or nothing of distance learning;
- Brazil was the last country with a population of over 100 million to establish an “open university” (2006);
- Brazil’s Open University is a consortium of conventional federal universities (and hence does not offer its own degrees), and requires passing an exam to enter (and so is not truly “open.”

There are still other obstacles to the arrival of the “learning city” in Brazil, among them the question of who will finance free access to wireless broadband, a phenomenon taking place in some other nations? For example, I live in São Paulo, one of the largest cities in the world. Twelve million people live in São Paulo’s central area, and 20 million people in the greater metropolitan area. A candidate in the current race for mayor has promised that, if elected, she will cover the central area with wireless services (Wi-fi, WiMAX and WiMesh). But her opponents have estimated the costs of such a measure to be over US$ 2 billion to install (without user terminals), and operating costs to reach *one third* of the population to be US$ 10.00 per month per user, or US$ 440 million per year, clearly a difficult expense at

the present moment. A more viable approach for the learning city, in Brazil, would be to concentrate investments for access in telecenters (free-access terminals in public places, of which there are already several hundred in the metropolitan area), schools, libraries, hospitals and government offices, and essentially oriented towards community services such as e-government, tele-learning, tele-medicine, and tele-commuting.

IV. Leapfrogging – A Solution?

As we have seen, there are many obstacles to be overcome in order to be able to use distance learning to help construct learning cities. And there is no recipe or prescription that can guarantee results. Perhaps the best advice is to think of the children's game "leapfrogging," in which the players jump over the shoulders of one another. As John W. Moravec and Arthur M. Hawkins have observed, leapfrogging is a form of "jumping over the obstacles to achieve a goal," or "to get ahead of the competition or the present state of the art through innovative, time-and-cost-saving means."[7] For example, with the current structure of the distance learning professional community around the world, it takes too long for an innovation, or a "best practice" in distance learning to be shared around the world. There is a clear and urgent need for greater and more rapid communication among distance learning specialists. A three-tiered system of communication (global, regional and local), each tier made up of the institutions and professionals working in the area, would guarantee awareness of new problems affecting the practice of distance learning, and the solutions being found. It would make for a single, vibrant community of practice. The only elements lacking are more national associations and a regular flow of information among all participants.



There are a number of other measures which could be taken to improve and accelerate communication with the professional community.

-- There are some 10-15 scholarly periodicals around the world concerned with distance learning. They are practically unknown in developing countries, principally for reasons of cost. If there were a freely-available online cataloging of the contents of all of these journals, it would promote an increased flow of information and knowledge.

-- There is a need for national, regional and global cataloging of available distance learning courses, both those officially recognized by governments or other bodies, and those which are of an informal nature. This would facilitate student recruiting on a global scale.

-- In developing countries there still exists, in many quarters, rejection of distance learning. Hence, it would be valuable, to increase the credibility of distance learning, to have readily available, specially-collected research papers, especially of a quantitative or experimental nature, to be used to counteract measures against distance education.

There is much to be accomplished in the coming years, but the benefits to be gained, both by individuals and society in general, more than justify the efforts.

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