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EVALUATION OF PAN AMERICAN CENTERS: LATIN AMERICAN CENTER FOR EDUCATIONAL TECHNOLOGY IN HEALTH (CLATES)

The present document represents an internal evaluation of the Latin American Center for Educational Technology in Health, based on self-analysis by the Center's staff, followed by a broad review, conducted by PAHO Headquarters staff, of the work and achievement of CLATES' ten years of operation.

The level of development attained is implicit in the consolidation of the national nucleus (NUTES), which had heretofore functioned as an integral part of CLATES but is now considered to be self-sufficient--and in the existence of another 23 institutions devoted to the same type of activities in various Latin American countries. Such achievements indicate that the initiative promoting the transfer and adaptation of educational technology for the training of health care personnel has been eminently successful.

The evaluation further suggests a possible change in the program focus, terminating the direct contribution of the international component that has served as part of the integrated agency. The reoriented goal would seek greater mobilization of the national resources identified in the various countries on behalf of the ongoing effort to develop educational technology in the field of health.

Introduction

The present report represents the evaluation of Pan American Centers as required by the XX Pan American Sanitary Conference (Resolution CSP20.R31, adopted in 1978). Unlike the other Centers, however, the Latin American Center for Educational Technology in Health (CLATES) was evaluated on an in-house basis, due to a number of special circumstances that dictated the use of such procedure.

One of those circumstances was the fact that CLATES was founded at the initiative of a single Member Government (Brazil), acting in conjunction with the Organization but without specific approval from the Directing Bodies other than the general mandate conferred by approval of PAHO's program and budget.

This particular Latin American Center works closely with a national counterpart which, to the extent that it is fully autonomous, may not only function independently of the international component but may even replace that body, both in Brazil and in other countries. A precedent for such action was set by its fellow agency, CLATES/Mexico, where the Latin American component was discontinued, paving the way for possible similar action in the present instance.

Another factor must also be taken into account. Brazil's Ministry of Health, the same agency that signed the Basic Agreement and helped finance CLATES until 1977, has removed this item from its budget in recent years. Furthermore, the Ministry has indicated to PAHO that the justification for maintaining the Center as an international agency should be reviewed in the light of the present status of this type of program.

Given the situation just described and the possible discontinuation of the international component, the present evaluation was designed to review the performance and degree of development attained by the national institutions in order to be certain that CLATES will no longer be indispensable.

Its in-house origin notwithstanding, the present evaluation is no less thorough than those conducted at the other Centers. In fact, they too were based on a preliminary stage of self-analysis and review conducted by the staff members themselves, followed by an exhaustive study of the agency's achievements both in the host country and throughout Latin America, made by specialists from PAHO Headquarters.

The report includes a review of the events that led to establishment of the Center; a study of its operational evolution; a summary of its program and activities vis-à-vis the overall objectives set forth in the Basic Agreement; an overview of the Center's accomplishments during its 10 years of operation; and concluding remarks intended to sum up all of the foregoing and to point out the way such programs should be handled in the future.

#### 1. Historical Background

By the late 1960s, the cumulative experience acquired by the World Health Organization and the Pan American Health Organization in promoting education and training activities and particularly in technical

cooperation for institutional development in this field made it evident that a radical change was needed in teaching procedures to achieve an appreciable increase in the capacity of the educational system.

In October 1969, WHO convened a consultative group in Geneva for the specific purpose of assessing the need for reorientation of teacher training. An Interregional Center for Teacher Training (ITTC) was set up under an agreement with the University of Chicago's Center for Educational Development as a result of the Geneva meeting.

In 1971, WHO held an interregional seminar on the same subject (October 10-28, in Chicago), at which the establishment of regional teacher-training centers was proposed.

The next year (October 1972), another study group met in Geneva to examine this proposal in greater detail. Close scrutiny was given not only to its specific content relative to the training of teachers in educational planning, curriculum development, methodology and evaluation, but to the role they should play in the areas of research and direct service activities (both counseling and in the production of teaching material) as well. This was the starting point for overtures leading to the establishment of regional centers in five of the WHO Regions in 1972. In principle, the following options were selected: AFRO--Kampala, Uganda (English) and Yaounde, Cameroon (French); AMRO--Rio de Janeiro, Brazil (Portuguese) and Mexico City, Mexico (Spanish); EMRO--Shiraz, Iran; SEARO--Bangkok, Thailand; and WPRO--Sydney, Australia.

The ultimate goal of this program, however, was not to perpetuate the regional centers, but rather to promote and encourage the gradual establishment of national centers.

## 2. The founding of CLATES

In the Region of the Americas, the subject was discussed at length at the First Workshop on Education in Health Sciences, held in Washington, D.C., January-March 1971. It was soon perceived that a systematic and two-pronged effort was needed: first, to facilitate the decision-making, implementation and evaluation process through a concise definition of learning objectives; and, second, to develop the necessary means (teaching materials) to accomplish the educational goals.

The quest for interest and potential in the various countries of the Region began. In less than a year, it led to two national institutions, the first in Rio de Janeiro in 1972 and the second in Mexico City in 1973. Both were based at prominent and nationally recognized medical schools having the support of the corresponding Ministries of Health.

From the PAHO standpoint, both initiatives were based on individual country projects--Brazil-6700 and Mexico-6700. Nevertheless, they were given a regional title, Latin American Center for Educational Technology in Health, to denote their intended role as "poles of development" in a new field of activity that would eventually be extended to all the other Member Countries. Later on (1974-1975), WHO adopted the same concept of educational technology in its broadest sense, as the application of scientific knowledge about the learning/teaching process for the purpose of organizing and facilitating education through appropriate methods and media.

In the specific case of the Brazilian center under review here, the host University established a parallel national unit at the outset: the Nucleus of Educational Technology for Health (NUTES). The long-term objective of setting up the national component was implicit in its title. From that time onward, the Center was known as NUTES/CLATES. The agreement with the Government of Brazil, however, made PAHO responsible for coordination and for appointing its Director.

The Basic Agreement was signed on 20 September 1972 by the Ministry of Planning, the Ministry of Health, the Rio de Janeiro Federal University and its Biophysics Institute (where the project originated), and the Pan American Health Organization. The original expiration date was 1977, but the agreement was extended by amendment on four occasions and will remain in force until December 1983.

### 3. Operational Evolution of the Center

CLATES is now in its eleventh year of uninterrupted operation. It has undergone two distinct stages. The first was from 1972 through 1979, when the international and the national components (CLATES-NUTES) operated under the same management. The second began in April 1980, when a separate management was established for each, although they continued to work in close coordination and at the same premises.

An important characteristic of the first stage was the limited amount of international support received. This was the incentive for developing the national nucleus, which might be considered to constitute a risk from the standpoint of international cooperation. Thanks to strong leadership and external financing (PAHO/Kellogg), an initial national group of 12 professionals was convened. Its express purpose was to utilize all of available educational resources, guiding their development in a specific area (health) in order to provide local and international support for a sector whose internal assets did not include this technology. The project thus embraces the possibility of technical cooperation among developing countries (TCDC) in addition to its intersectoral endeavors.

During the initial phase of operation, PAHO's contribution remained more or less stable--between 10 and 18 per cent of the total budget--until 1977. The University (the principal local participant) contributed a constantly increasing amount--aside from slight differences in the exchange rate--which rose from an initial 20 to 45 per cent in 1981. During this time, funds began to pour in from other national agencies which engaged CLATES to carry out specific projects. Income from that source grew from 20 per cent in 1973 to about 50 per cent between 1975 and 1978.

Unfortunately, the national financial situation became increasingly unstable at that point. The value of local currency vis-à-vis the dollar dwindled, and the tightened budgets of the other national agencies forced them to cut their contributions to the Center to 13.5 per cent of the total operating budget.

The overall budget, which had peaked at US\$1,235,961 in 1978, plummeted to \$710,024 in 1980, a drop of about 40 per cent. PAHO's relative contribution increased during that period to over 35 per cent.

The following tables show both absolute and relative values of all financing received to date.

The Center's second operational stage covers the 3-year period since the two separate managements were set up. This coincided with the emergence of a number of adverse factors, starting in 1978. Among them were:

- a) the conclusion of some of the most important projects, with the consequent relinquishment of technical staff whose salaries were funded under those contracts;
- b) the degree of nationwide saturation reached in respect to the type of program offered by the Center;
- c) the departure of a number of nationals on the staff for training overseas;
- d) the need to revise policy regarding the international component to make it congruent with the new strategies of health for all by the year 2000.

Table 3 shows a stabilization plateau in the University budget. It marks incorporation into the regular payroll of staff theretofore funded by contracts with other national agencies, thus bringing the national nucleus to a relatively self-sufficient level.

TABLE 1  
FUNDING\*

|              | N A T I O N A L                   |                  |  |                   | I N T E R N A T I O N A L |                  |                        | Grand Total      |
|--------------|-----------------------------------|------------------|--|-------------------|---------------------------|------------------|------------------------|------------------|
|              | Ministry of Health <sup>(1)</sup> | University (2)   | Other National Agencies <sup>(3)</sup> | National Subtotal | Kellogg (4)               | PAHO/WHO (5)     | International Subtotal |                  |
| <u>1973</u>  | 129,600                           | 108,271          | 109,573                                | 347,444           | 127,483                   | 57,147           | 184,630                | 532,074          |
| %            | 24.4                              | 20.3             | 20.6                                   | 65.3              | 24.0                      | 10.7             | 34.7                   | 100              |
| <u>1974</u>  | 100,000                           | 131,287          | 138,596                                | 369,883           | 116,667                   | 69,325           | 185,992                | 555,875          |
| %            | 18.0                              | 23.6             | 24.9                                   | 66.5              | 21.0                      | 12.5             | 33.5                   | 100              |
| <u>1975</u>  | 83,455                            | 126,891          | 411,176                                | 621,522           | 69,375                    | 126,824          | 196,199                | 817,721          |
| %            | 10.2                              | 15.5             | 50.3                                   | 76.0              | 8.5                       | 15.5             | 24.0                   | 100              |
| <u>1976</u>  | 64,159                            | 119,220          | 403,714                                | 587,093           | 80,705                    | 117,682          | 198,387                | 785,480          |
| %            | 8.2                               | 15.2             | 51.3                                   | 74.7              | 10.3                      | 15.0             | 25.3                   | 100              |
| <u>1977</u>  | 70,319                            | 136,066          | 420,645                                | 627,030           | 73,137                    | 156,428          | 229,565                | 856,595          |
| %            | 8.2                               | 15.9             | 49.1                                   | 73.2              | 8.5                       | 18.3             | 26.8                   | 100              |
| <u>1978</u>  | 125,818                           | 229,631          | 628,707                                | 984,156           | 27,500                    | 224,305          | 251,805                | 1,235,961        |
| %            | 10.2                              | 18.6             | 50.9                                   | 79.7              | 2.2                       | 18.1             | 20.3                   | 100              |
| <u>1979</u>  | 143,693                           | 186,845          | 468,617                                | 799,155           | 46,156                    | 265,352          | 311,508                | 1,110,663        |
| %            | 12.9                              | 16.8             | 42.2                                   | 71.9              | 4.2                       | 23.9             | 28.1                   | 100              |
| <u>1980</u>  |                                   | 269,694          | 121,967                                | 391,661           | 39,791                    | 278,572          | 318,363                | 710,024          |
| %            |                                   | 38.0             | 17.2                                   | 55.2              | 5.6                       | 39.2             | 44.8                   | 100              |
| <u>1981</u>  |                                   | 358,008          | 120,376                                | 478,384           | 76,365                    | 228,572          | 304,937                | 783,321          |
| %            |                                   | 45.7             | 15.4                                   | 61.1              | 9.7                       | 29.2             | 38.9                   | 100              |
| <u>1982</u>  |                                   | 377,893          | 129,017                                | 506,910           | 149,572                   | 290,320          | 439,892                | 946,802          |
| %            |                                   | 40.0             | 13.5                                   | 53.5              | 15.8                      | 30.7             | 46.5                   | 100              |
| <u>1983</u>  |                                   | 297,137          | 149,302                                | 446,439           | 33,028                    | 256,300          | 289,328                | 735,767          |
| %            |                                   | 40.4             | 20.3                                   | 60.7              | 4.5                       | 34.8             | 39.3                   | 100              |
| <b>TOTAL</b> | <b>717,044</b>                    | <b>2,340,943</b> | <b>3,101,690</b>                       | <b>6,159,677</b>  | <b>839,779</b>            | <b>2,070,827</b> | <b>2,910,606</b>       | <b>9,070,283</b> |
| %            | 8.0                               | 25.8             | 34.2                                   | 68.0              | 9.2                       | 22.8             | 32.0                   | 100              |

(1) Ministry of health and other health sector agencies (FIOCRUZ)

(2) Rio de Janeiro, Federal University, including CESGRANRIO and IBICT

(3) Other national agencies: FINEP, PNTE, FUNTEC, SUBIM, INPS, DATARREV, IPEA, ABES, CAERN, SANEPAR, Ministry of Education, CAPES, DAV

(4) Kellogg: Funding to CLATES directly or through PAHO/PAHEF (Nursing and PLADES)

(5) PAHO/WHO regular funds, AMRO-8770, 8700 and 6900.

\* Actual expenditures from 1973 through 1982; projected 1983 budget.

TABLE 2

NATIONAL AND INTERNATIONAL CONTRIBUTIONS TO CLATES,  
1973-1983 (in thousands of dollars)

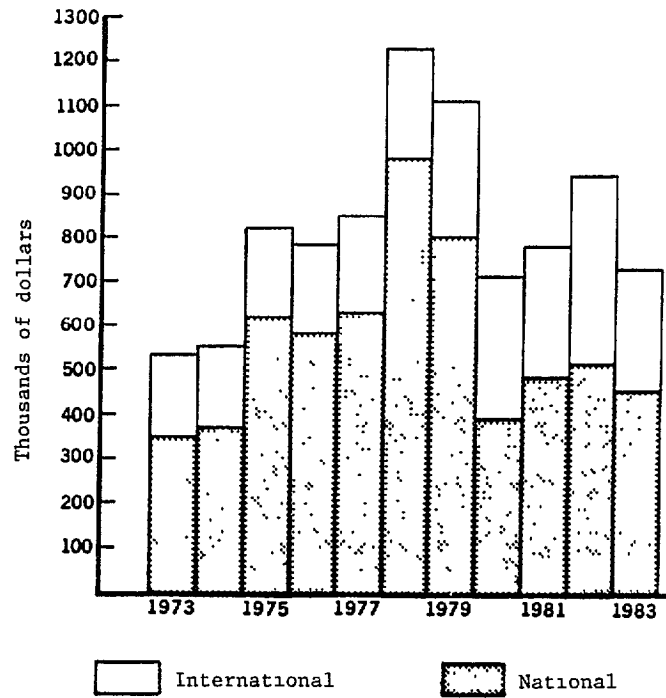
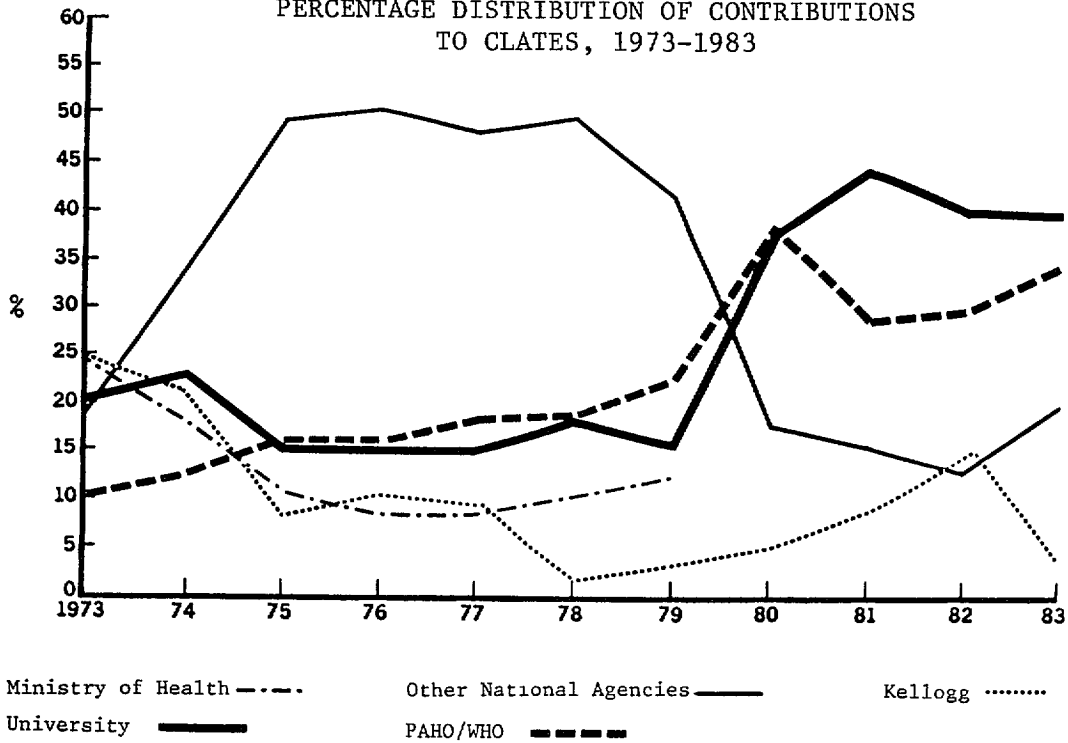


TABLE 3

PERCENTAGE DISTRIBUTION OF CONTRIBUTIONS  
TO CLATES, 1973-1983



Another aspect to be considered in this review of the Center's operational evolution is the staffing chart utilized since the time of its founding.

Table 4 reflects the concern with holding international personnel to a minimum, emphasizing the rising number of local human resources in the growth and development of the program.

TABLE 4  
CLATES STAFF POSITIONS, 1973-1983

|               |                        | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 |
|---------------|------------------------|----|----|----|----|----|----|----|----|----|----|----|
| LOCAL         | PROFESSIONAL           |    | 11 | 19 | 26 | 35 | 39 | 41 | 36 | 35 | 30 | 34 |
|               | SUPPORT                | 1  | 5  | 11 | 18 | 22 | 20 | 24 | 29 | 27 | 25 | 22 |
|               | TOTAL                  | 1  | 16 | 30 | 44 | 57 | 59 | 65 | 65 | 62 | 55 | 56 |
| INTERNATIONAL | PROFESSIONAL           | 1  | 1  | 1  | 1  | 1  | 3  | 3  | 3  | 3  | 4  | 4  |
|               | SUPPORT                |    | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  |
|               | SHORT-TERM CONSULTANTS |    | 3  | 6  | 8  | 6  | 5  | 2  | 4  | 1  | 3  | 4  |
|               | TOTAL                  | 1  | 5  | 8  | 10 | 8  | 9  | 6  | 8  | 6  | 9  | 10 |
| GRAND TOTAL   |                        | 2  | 21 | 38 | 54 | 65 | 68 | 71 | 73 | 68 | 64 | 66 |

In addition to the staff responsible for international projects assigned to the Center, PAHO has provided the short-term services of international consultants. This had made it possible to transfer and adapt the necessary know-how to utilize new methodology and the latest production techniques for teaching material.

The total number of local staff at the Center reached somewhat higher levels in 1978 and 1979, but dropped back to the 1976 status in the last two years. This would appear to be the optimum activity level in terms of present demand for services and budgetary funds available.

#### 4. Accomplishments

During its 10 years of operation, NUTES/CLATES has carried out 10 national projects, plus two international programs covering all of Latin America. In doing so, it has: promoted and conducted research; held specialized courses, both at its own headquarters and in other countries; produced large quantities of teaching materials; and awarded a substantial number of study grants to scholars throughout the Region. Details



will be given further on in this document. Although it is difficult to separate the respective contributions made by CLATES and NUTES, owing to the close working relationship involved, we shall attempt to indicate the extent to which each participated.

The projects in question dealt with the following subjects:

a) Regional Programs:

1. Development and application of educational technology for the training of human resources in health care throughout Latin America--PAHO and CLATES/NUTES;
2. Development of educational technology for the nursing profession in Latin America--Kellogg and CLATES

b) National Projects:

1. Development of self-teaching courses in the biomedical sciences (IPEA-NUTES)
2. Production of audiovisual material (CNAN/IPEA--NUTES)
3. Clinical training programs (Ministry of Health--NUTES)
4. Use of minicomputers in education and health (BNDE/FUNTEC--NUTES)
5. Production of alternative formats for large-scale training (CEBRAE/PNTE--NUTES)
6. Development of educational technology for the teaching of engineering (MEC/DAU--NUTES)
7. Application of educational technology to training in public health (FIOCRUZ/PPREPS--NUTES/CLATES)
8. Development of educational technology (at institutional and programming levels) (FINEP--NUTES)
9. Application of educational technology in training human resources for social security programs (NUTES)
10. Transfer of educational technology for pilot projects in basic sanitation (BNH/ABES--NUTES)

Objective A: Heightened efficiency of the system of human resources for health care.

Lines of Work

- technical assistance in creating and developing human resource units in ministries of health in Brazil and other Latin American countries (NUTES/CLATES).
- advisory services to universities, colleges and schools of health sciences in the area of educational technology (NUTES/CLATES)
- participation in other PAHO programs (CLATES/NUTES)
- direct cooperation with public health schools (ABRASCO--CLATES/NUTES)
- collaboration with social security agencies such as INAMPS (in Brazil), for which programs were drawn up to train technical and auxiliary staff (NUTES)

Objective B: Ensuring the quality of education, even for large numbers of students.

Objective C: Individualized instruction to adjust learning time to each student's specific needs and provide a more flexible curriculum.

Lines of Work

Because of the population explosion in Latin America, together with the establishment of numerous schools in the area of health, traditional teaching systems are no longer geared to meet the increasing demand for admission and high academic standards. To resolve these problems, the Center, assisted by NUTES technical staff, promoted and developed individual learning systems for each student; audiovisual media and computers as tools for teaching and learning; systems for students to evaluate their own progress; and the use of simulation formats.

Objective D: Upgrading of university faculty expertise in pedagogical concepts and training in the use of modern teaching techniques.

Lines of Work

- development of short-term teacher training courses at NUTES/CLATES headquarters--mostly organized and conducted by NUTES faculty--and in other Latin American countries, where they were given by the CLATES international professional staff, with the support of NUTES.
- inclusion of NUTES pedagogical courses in the postgraduate curriculum offered by the Rio de Janeiro Federal University.
- development of a teacher training system for university professors, based on self-teaching modules produced by NUTES and reproduced by CLATES in the four official PAHO languages

Objective E: Research on and development of educational programs utilizing new technology, and evaluation of their applicability to various university situations by means of experimental courses.

Lines of Work:

Educational research, most of it conducted by CLATES and NUTES staff.

## 5. Production Record

This section will consist of objective information and statistics on the Center's production in its various fields of activity. The respective participation of the national nucleus and the international group is indicated in each case.

### a) Self-teaching systems in specific areas--modular packages

1. Teacher training system for university professors: 15 modules, NUTES

2. Training system of the Expanded Program on Immunization: 5 modules, CLATES
3. Basic training for nursing aides: 24 modules, NUTES
4. Training system for local health service administrators: 30 modules, NUTES
5. Computerized system for tutorial self-evaluation in medical studies: 7 modules, NUTES

b) Teaching material

NUTES/CLATES has produced large quantities of teaching material. Its policy has been to develop such items as an integral part of a specific teaching program rather than as an isolated activity. Material produced by other institutions was also adapted and translated.

The catalog of NUTES/CLATES audiovisual material contains a detailed description of 594 units in various formats. Table 5 shows the number and type of presentation for each field covered.

TABLE 5

|                                 | AUD       | FLO       | FST       | MIC       | SLI        | TEX        | VTE        | TOTAL      |
|---------------------------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Morphofunctional Sciences       | 8         | 15        | 2         | 1         | 38         | 56         | 78         | 198        |
| Microbiology and Pathology      |           |           | 21        | 11        | 11         |            | 1          | 44         |
| Clinical practice*              | 27        |           | 3         | 23        | 39         | 31         | 20         | 143        |
| Nursing                         | 1         | 1         | 1         |           | 3          | 17         | 15         | 38         |
| Public Health**                 | 1         |           | 46        |           | 29         | 27         | 19         | 122        |
| Education and Medical Education | 3         |           | 7         | 10        | 5          | 18         | 6          | 49         |
| <b>TOTAL</b>                    | <b>40</b> | <b>16</b> | <b>80</b> | <b>45</b> | <b>125</b> | <b>149</b> | <b>139</b> | <b>594</b> |

\* Includes odontology  
 \*\* Includes social sciences and health education  
 Key: AUD = audiotape                      FLO = film loop  
       FST = filmstrip                      MIC = microfiche  
       SLI = Slide series                  TEX = text  
       VTE = video tape

The national nucleus contributed the work of almost all the technicians for this production (the only CLATES staff member was the section chief). Faculty members of the UFRJ (Rio de Janeiro Federal University) also played an important part in deciding on course content.

The project on Educational Technology in Nursing, to which CLATES made the major contribution, promoted the production of teaching material at the nine Latin American subcenters. The quantities are shown in Table 6.

TABLE 6

| FORMAT | TARGET POPULATION |           | TOTAL |
|--------|-------------------|-----------|-------|
|        | PROFESSIONAL      | AUXILIARY |       |
| TEX    | 140               | 10        | 160   |
| SIM*   | 20                |           | 20    |
| VTE    | 3                 |           | 3     |
| SLI    | 30                | 10        | 40    |
| SLS**  | 20                | 5         | 25    |
| TOTAL  | 213               | 25        | 248   |

\*Simulation

\*\*Slide with audio

### c) Study grants

As noted earlier, NUTES/CLATES has been extremely active in mobilizing study grants in the various countries of Latin America. Its strategy has been to avoid singling out grant recipients from different institutions, giving preference to groups of 5 to 10 fellows from the same institution as a means of creating sufficient numbers of this critical resource to produce an impact upon their return. In addition to those awarded by PAHO, grants were given to NUTES by Brazil's Ministry of Foreign Relations (SUBIM) and the Kellogg Foundation. NUTES itself contributed funds received under a subsidy from CESGRANRIO (the agency responsible for the University's entrance examinations). Table 7 shows the distribution of these grants.

TABLE 7

| YEAR  | AGENCY |       |         |       | TOTAL |
|-------|--------|-------|---------|-------|-------|
|       | PAHO   | SUBIM | KELLOGG | NUTES |       |
| 1974  | 7      |       |         |       | 7     |
| 1975  | 3      |       |         |       | 3     |
| 1976  | 16     | 16    |         |       | 32    |
| 1977  | 45     | 117   |         | 10    | 172   |
| 1978  | 27     | 98    | 15      | 11    | 151   |
| 1979  | 35     | 49    | 10      | 24    | 118   |
| 1980  | 48     | 42    | 12      | 25    | 124   |
| 1981  | 43     | 30    | 78      | 7     | 158   |
| 1982  | 69     | 24    | 33      |       | 126   |
| TOTAL | 293    | 376   | 148     | 77    | 894   |

d) Courses, workshops and seminars

The Center held 283 courses in the area of direct training: 150 at its headquarters, 23 elsewhere in Brazil and 110 in other Latin American countries. They were attended by 7,193 professionals, 2,614 of whom came from other parts of Latin America. With few exceptions, the courses given at NUTES/CLATES headquarters were conducted by the NUTES group of professors. Those offered in other Brazilian states received advisory services from CLATES and support from NUTES. CLATES was responsible for training in other Latin American countries, and appointed short-term consultants from the NUTES staff for this purpose.

Another 5,040 professionals attended courses offered by the nine nursing subcenters at their respective headquarters and outlying schools. This brought the grand total of health service personnel exposed to some type of training to 13,233 over the past 10 years. Of that number, 7,654 were from countries other than Brazil.

Table 8 shows the distribution of Latin Americans enrolled in courses at NUTES/CLATES headquarters; in those given by NUTES/CLATES staff in other regional countries; and in those offered by other institutions, using their own staff.

TABLE 8

LATIN AMERICAN PARTICIPANTS IN TRAINING ACTIVITIES

|       | CLATES/General Courses       |                    | Educational Technology in Nursing |                           | TOTAL |
|-------|------------------------------|--------------------|-----------------------------------|---------------------------|-------|
|       | At NUTES/CLATES Headquarters | In other countries | Funded by NUTES/CLATES            | Funded by local resources |       |
| ARG   | 54                           | 35                 |                                   |                           | 89    |
| BOL   | 43                           | 168                |                                   |                           | 211   |
| CHI   | 68                           | 194                | 200                               | 870                       | 1,332 |
| COL   | 152                          | 270                | 270                               | 980                       | 1,672 |
| COR   | 18                           | 91                 | 160                               | 320                       | 589   |
| CUB   |                              | 60                 |                                   |                           | 60    |
| ELS   | 16                           |                    |                                   |                           | 16    |
| ECU   | 65                           | 287                | 160                               | 300                       | 812   |
| GUA   | 33                           | 26                 |                                   |                           | 59    |
| HON   | 29                           | 27                 |                                   |                           | 56    |
| MEX   | 55                           | 91                 | 160                               | 400                       | 706   |
| NIC   | 15                           | 34                 |                                   |                           | 49    |
| PAN   | 17                           |                    |                                   |                           | 17    |
| PAR   | 35                           | 72                 |                                   |                           | 107   |
| PER   | 132                          | 272                | 300                               | 920                       | 1,624 |
| RED   | 26                           | 35                 |                                   |                           | 61    |
| URU   | 22                           | 40                 |                                   |                           | 62    |
| VEN   | 34                           | 90                 |                                   |                           | 124   |
| WASH  |                              | 8                  |                                   |                           | 8     |
| TOTAL | 814                          | 1,800              | 1,250                             | 3,790                     | 7,654 |

The courses covered a wide range of topics, the most important of which (courses given most frequently) were:

1. Planning in education
2. Teaching and learning methodology
3. Educational evaluation
4. Supervision at peripheral health care units
5. Integration of faculty and auxiliary staff
6. Self-help and modular teaching
7. Use of simulation in education
8. Teaching methods applied to higher education
9. Nurses training courses
10. Audiovisual media in education.

In addition to the above short-term courses, NUTES worked with the Rio de Janeiro Federal University in the curriculum offered to candidates for a master's degree. A total of 1,266 students took the NUTES courses in medical pedagogy and special teaching methods.

TABLE 9

| SUBJECTS                    | 1978 | 1979 | 1980 | 1981 | 1982 | TOTAL |
|-----------------------------|------|------|------|------|------|-------|
| Medical Pedagogy            | 90   | 131  | 125  | 149  | 96   | 591   |
| Special Teaching<br>Methods | 139  | 139  | 153  | 138  | 106  | 675   |
| TOTAL                       | 229  | 270  | 278  | 287  | 202  | 1,266 |

e) Research projects

When it was founded, NUTES/CLATES set up an educational research and development section devoted to analysis of the latest methods in the teaching/learning process. Research projects were not limited to the field of education; they also dealt with situations in the health care services that might require changes in staff training procedures, thus constituting a truly interdisciplinary undertaking.

As may be seen in the following list of the Center's 28 projects, 2 were carried out by CLATES staff; 5 by the joint efforts of CLATES and NUTES staff; and 21 by NUTES staff, 3 of which were theses for master's degrees in educational technology sponsored by NUTES. Priority was given to studies designed to solve concrete problems through what might be termed "action-oriented research."

1. Implementation and evaluation of a health care system centering on patients' problems. Luiz Carlos Lobo, CLATES.

1975

2. Training evaluation and its impact on learning. M. A. Siguaud Lent, NUTES.
3. A comparative study of the retention and application of knowledge obtained by students of the basic course in medicine through self-teaching or conventional programs in the clinical cycle. M. A. Roschke.
4. Learning preferences and personality types in four health area professions. M. Noemi Villaverde, NUTES.
5. A comparative study of the attitudes of students enrolled in health sector courses regarding the relative merits of self-teaching and traditional instruction methods. Eliane Brigida Moraes Falcao, NUTES.
6. Correlation between specific curricular training (public health, obstetrics) and professional nursing practice. Maria Alina de Almeida Souza, NUTES.
7. Organization of outpatient consultations at the university hospital. Analysis of criteria and development of methodology for the assignment of shifts to specialized services. Establishment of an information system. Claudio Amorim and Fernando Chiyoshi, 1976, NUTES.
8. Application of educational technology to the training of human resources for health care. E. Rodríguez Neto, 1977, NUTES.

1978

9. Utilization of educational technology at the Rio de Janeiro Federal University. Virginia Leite de Almeida, NUTES.
10. Evaluation of implementation of the large-scale training system at the Londrina State University. Nilma Santos Fontanive, NUTES.
11. Influence of "guide professor" training on student performance and evaluation of this role. Eliane Brigida de Moraes Falcao, NUTES.
12. Extension program in health care coverage and training of human resources. Eric Rosas, NUTES.
13. Structuring of an educational program using filmstrips with sound track. Linguistic and semiological analysis. Fernando Lefevre, NUTES.
14. Evaluation of the image of educational components and instruction based on visual and audiovisual aids. Fernando Lefevre, NUTES.
15. Computerized planning of university class schedules. Claudio Amorim, NUTES
16. Development of MUMPS technique for microprocessors. Sandra M. Díaz, Nilce Corela and Claudio Amorim, NUTES.
17. Comparative study of existing computer software for the presentation of dynamic simulations. Claudio Amorim, NUTES.

1979-1980

18. Diagnosis of NUTES/CLATES advisory services. NUTES.
19. The exercising of authority by a group of university professors. Thesis for master's degree in educational technology. NUTES.
20. Impact of training given to counseling professors on interpersonal relationships. Thesis for master's degree in educational technology, NUTES.



21. An experiment in the teaching of entomology. Group-oriented teaching. Thesis for master's degree in educational technology, NUTES.
22. A study of medical education as a step toward hegemony. Eleuterio Rodríguez Neto, NUTES.
23. Communications in the supervision of primary care programs. C. A. Linger and Cleonice E. Gonzalez, CLATES/NUTES
24. Quest for a didactic and curricular planning model predicated on actual health conditions. Cleonice E. Gonzalez and E. Rodríguez Neto, NUTES
25. Women as the primary health care agents in rural communities. C. A. Linger and Cleonice E. Gonzalez, CLATES/NUTES.
26. Bank of teaching resources for primary care programs. C. A. Linger and Cleonice E. Gonzalez, CLATES/NUTES.
27. Survey of extension programs on coverage and primary care in Bolivia. C. A. Linger and Cleonice E. Gonzalez, CLATES/NUTES

1981-1982

28. Research on auxiliary training projects under the Latin American Program for Educational Development in Health Care (PLADES). CLATES

#### f) Institutional development

An important consideration is the impact that CLATES has had on the promotion and development of educational technology at the institutional level, either through direct coordination, organization and financing--as in the case of the establishment of NUTES, the Brazilian nucleus which serves as headquarters for the international program--or through various modes of partial support. The latter may take the form of: training specialized personnel; advisory services in technology development; exchange of teaching material; or assistance in holding courses and seminars. It may even consist of limited amounts of financial aid. This type of funding helped to set up a series of new educational technology units in other Latin American countries. The nursing technology subcenters were specifically organized by CLATES with financing from the Kellogg Foundation.

CLATES, working in conjunction with NUTES, unquestionably constituted the first educational technology entity devoted exclusively to the Latin American health sector. It is evident that an additional 23 specialized units or programs were established in various countries of Latin America as a direct or indirect result of action taken by CLATES since its inception. A complete list appears below.

HEALTH EDUCATION TECHNOLOGY UNITS

1. Unidad de Producción de Material Educativo  
División de Recursos Humanos  
Ministerio de Salud Pública  
Honduras
2. N.I.D.E.S.  
Facultad de Medicina  
Universidad de Costa Rica  
San José, Costa Rica
3. Centro Universitario de Tecnología Educativa en Salud (CEUTES)  
México, D.F., México
4. Vice Ministerio de Docencia  
Centro de Materiales Educativos para Técnicos Medios  
Managua, Nicaragua
5. Centro de Audiovisuales  
Facultad de Medicina  
Universidad de la República Oriental del Uruguay  
Montevideo, Uruguay
6. Departamento de Divulgación  
Centro de Ayudas Audiovisuales  
Facultad de Medicina Veterinaria y Zootecnia  
U.N.A.M.  
México, D.F., México
7. Centro de Comunicaciones Audiovisuales  
Facultad de Medicina de Buenos Aires  
Buenos Aires, Argentina
8. Vice Ministerio de Docencia  
Centro de Materiales Audiovisuales  
Programa de Educación Continuada  
Ministerio de Salud Pública  
La Habana, Cuba
9. Vice Ministerio de Docencia  
Centro de Perfeccionamiento Pedagógico para Personal Técnico Medio  
Ministerio de Salud Pública  
La Habana Cuba
10. Biblioteca de Medios Audiovisuales  
Universidad Peruana "Cayetano Heredia"  
Lima, Perú
11. Centro de Materiales Audiovisuales  
Facultad de Odontología  
Universidad de Panamá  
Panamá, Panamá
12. Centro de Audiovisuales y Biblioteca de Medios  
Facultad de Medicina Militar  
Universidad Militar  
Bogotá, Colombia
13. N.I.D.E.S. Paraguay  
Facultad de Medicina  
Universidad de Paraguay  
Asunción, Paraguay
14. Centro de Formación de Personal de Salud  
Dirección de Recursos Humanos  
Secretaría de Salud  
Santo Domingo, República Dominicana

SUBCENTERS FOR EDUCATIONAL TECHNOLOGY IN NURSING

1. Escuela de Enfermería  
Universidad Federal de Minas Gerais  
Ciudad Universitaria  
Belo Horizonte, Minas Gerais, Brasil
2. Escuela de Enfermería  
Universidad de Costa Rica  
San José, Costa Rica
3. Centro Nacional de Tecnología Educativa en Enfermería  
Universidad Nacional Mayor de San Marcos  
Av. Brasil 642  
Breaña, Lima, Perú
4. Escuela de Enfermería  
Universidad Federal da Bahia  
Ciudad Universitaria  
Canela 40.000  
Salvador, Bahia
5. Centro de Tecnología Educativa  
Facultad de Enfermería  
Universidad Nacional de Colombia  
5º piso, Facultad de Medicina  
Bogotá, Colombia
6. Centro de Tecnología Educativa  
Departamento de Enfermería  
Universidad del Valle  
Apartado Aéreo 2188  
Cali, Colombia
7. Centro de Tecnología Educativa  
Departamento de Enfermería  
Universidad de Chile, Sede Norte  
Santiago, Chile
8. Centro de Tecnología Educativa  
Universidad Central  
Escuela Nacional de Enfermería  
Junto al Hospital Eugenio Espejo  
Quito, Ecuador
9. Centro de Tecnología Educativa  
Facultad de Enfermería  
Universidad Autónoma de Nuevo León  
Avenida Madero y Gonzalitos Al Pte.  
Monterrey, México

Those national educational technology centers met recently (1981) in Rio de Janeiro. Having agreed that they had reached a degree of maturity that could form the basis of a fruitful exchange, they decided to set up a network of the different institutions. By this time, each country had sufficient numbers of trained technical staff, and had produced teaching material comparable in quality to that of the guidance center, CLATES. The potential of NUTES was also recognized: it was asked to serve as the coordinating center for Brazil and to provide the other Latin American centers with technical cooperation as needed by each.

#### 6. Comments and Recommendations

Based on the foregoing review, NUTES/CLATES is considered to have played an important role in Latin America, not only in the accomplishment of its stated purpose but in the amount of work performed and the level of development it has attained.

This initiative has also succeeded in demystifying technological development characterized by excessive complexity, oversophistication and exaggerated cost which place it beyond the reach of the poorest countries. Its aim has been to serve as a guide to the use of methodology and materials that are appropriate to the users' situation. The agency's efforts were not limited to the local sphere of action. Utilizing the extension facilities conferred by its international status, it reached out to all the countries of Latin America and, in most of them, its advisory services, training facilities and exchange of materials helped to set up technical groups that would ensure the program's multiplier effect.

The greatest achievements of the program are the degree of self-sufficiency attained by the national nucleus, NUTES, working in conjunction with CLATES; and the subsequent establishment of 23 additional national centers in various Latin American countries.

The resources contributed by PAHO were used to the best possible advantage, enabling local staff to assist in programs conducted in other countries and making it possible to bring staff members from other parts of the region to attend courses at NUTES under study grants provided by the Brazilian Government.

Another factor to be taken into account is the high cost of international action, which can be borne only when there is genuine need. In the present case, this would consist of the work performed by the four professionals whose salaries are paid by the Organization, and whose 62 local colleagues at the national nucleus are now sufficiently well trained to assume full responsibility for the program.

The foregoing consideration necessarily brings us back to the statement made at the beginning of this report. The fact that development projects cannot be continued forever, but must undergo periodic review and adjustment, underscores the need for closely scrutinizing the justification for the indefinite prolonging of programs such as CLATES-- as pointed out by the Brazilian Government itself. Most importantly, it is essential to determine at a given point in the evolution of this type of project whether conditions are still appropriate for its continued existence, or whether optimal development would not consist of a strategic breaking away, based on the distinct possibility of NUTES self-sufficiency and of a redistribution of international resources that would support a new phase of expanded development throughout the entire network of similar institutions.

Given the evidence that NUTES is already responsible for most of the activities described, we must conclude that the national center may now be considered self-sufficient and can therefore operate independently of the support of CLATES, which would then no longer be necessary. It is proposed that the project be terminated at the end of the current extension (31 December 1983) and that it be replaced by a new agreement with the University which would provide for continued support to NUTES. This would have the further advantage of fostering direct mobilization of the national resources, consisting essentially of the network of Latin American centers in the field of educational technology for health.

Under the proposed realignment in technical terms of the possible application of resources, the 23-center network described would be able to increase the potential use of traditional educational methods and processes, facilitate the transfer of modern technology and make innovative progress in the search for new alternatives. The end result would be more efficient and effective teaching and learning, supported respectively by the regional program and by NUTES.

GLOSSARY

|            |   |
|------------|---|
| ABES       | Asociación Brasileira de Ingeniería Sanitaria                                 |
| ABRASCO    | Asociación Brasileira de Medicina Colectiva                                   |
| AFRO       | WHO Regional Office for Africa  |
| AMRO       | WHO Regional Office for the Americas  |
| BNDE       | Banco Nacional de Desarrollo Económico  |
| BNH        | Banco Nacional de Habitación  |
| CAPEB      | Coordinación del Perfeccionamiento del Personal de Enseñanza Superior         |
| CEBRAE     | Centro Brasileiro de Apoyo a la Pequeña y Mediana Empresa                     |
| CESGRANRIO | Comité de Educación Superior para el Gran Río                                 |
| CEUTES     | Centro Unitario de Tecnología Educacional en Salud - México                   |
| CLATES     | Latin American Center for Educational Technology in Health                    |
| CNAN       | Consejo Nacional de Alimentación y Nutrición                                  |
| DATAPREV   | Compañía de Procesamiento de Datos de la Previdencia Social                   |
| DAU        | Directoría de Asuntos Universitarios  |
| EMRO       | WHO Regional Office for the Eastern Mediterranean                             |
| FURO       | WHO Regional Office for Europe  |
| FINEP      | Financiadora de Estudios y Proyectos  |
| FIOCRUZ    | Oswaldo Cruz Foundation   |
| FUNTEC     | Programa de Desarrollo Tecnológico del Banco Nacional de Desarrollo Económico |
| IBICT      | Instituto Brasileiro de Información en Ciencia y Tecnología                   |
| IICA       | Inter-American Institute for Cooperation on Agriculture                       |
| INAMPS     | Instituto Nacional de Asistencia Médica y Previdencia Social                  |
| INPS       | Instituto Nacional de Previdencia Social                                      |
| IPEA       | Instituto de Planeamiento Económico y Social                                  |
| ITTC       | Centro Interregional de Adiestramiento de Profesores                          |
| KELLOGG    | W. K. Kellogg Foundation  |
| MFC        | Ministerio de Educación y Cultura   |
| VIDES      | Núcleo de Investigación y Desarrollo en Salud                                 |
| NUTES      | Nucleus of Educational Technology for Health                                  |
| WHO        | World Health Organization   |
| PAHO       | Pan American Health Organization  |
| PLADES     | Latin American Program for Educational Development in Health                  |
| PNTE       | Programa Nacional de Entrenamiento Ejecutivo                                  |
| PPREPS     | Programa de Preparación Estratégica de Personal de Salud                      |
| SANEPAR    | Compañía de Saneamiento del Estado de Paraná                                  |
| SEARO      | WHO Regional Office for South-east Asia                                       |
| SUBIN      | Secretaría de Cooperación Económica y Técnica Internacional                   |
| UFRJ       | Río de Janeiro Federal University   |
| WPRO       | WHO Regional Office for the Western Pacific                                   |