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BUILDING INTO THE EDUCATIONAL ORGANIZATION A
MECHANISM FOR CONTINUOUS REFORM AND INNOVATION

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How fast does the educational system change?

There are at least two main reasons why one should worry about expanding the present innovative capacity of a system. The first is that, by some standards, the pace of change of the system is considered too slow; the second is that whatever change may be taking place is not considered efficient enough. The main difference between these two approaches is that while the latter implies some normative judgment about the goals of the system and how they are being met, the former focuses only on the instrumental side of the matter. This paper will deal solely with the narrower question. Clearly, then, our first task is finding a norm that allows us to evaluate the pace of change of the educational system. Fortunately, enough social science research has been done in this area to reach a tentative conclusion. Let us briefly review these findings.

It is well known that very few social science findings are indisputable. A mathematician friend of mine who was interested in learning what sociology was about put

it in a somewhat sanguine but concise manner: "I get it," he said, "-- for every sociological proposition that is true, there is an exactly counter-proposition which is also true."

However, if there is a finding for which there is not a counter-proposition, it is that rural systems change more slowly than any other social systems. Since the educational system is also very often regarded as "conservative", it seems legitimate at the outset to compare the average length of the adoption period (the number of years it takes an innovation to be adopted by a substantial proportion of the population) for educational and for agricultural innovations. In this way we will have a relative basis for making a judgment. Here is the data:

(1) A careful tabulation of the adoption period for some 17 innovations in agriculture covering a period from 1942 to 1961, and including three cases studied in a Pakistani village, shows that, on the average, it takes about 3.3 years for 65 per cent of the farmers to adopt innovations such as hybrid seed corn, fertilizers or bulk milk tanks.¹ What is the pace of diffusion in education?

(2) A review of about 200 studies of educational innovations introduced in the United States² between the late

¹ See Rogers, Everett, Diffusion of Innovations, (New York: The Free Press), 1962. pp.104-106, Table 4-1.

² Most studies of diffusion of innovation in education that we are aware of have been done in the United States. Therefore, strictly speaking, the conclusions that follow are applicable only to that country. However, the reader should keep in mind that it is generally accepted that one of the main characteristics of developed societies such as the United States is that they have a built-in mechanism for change. That is, self-sustained growth is not only possible, but is the norm.

'30's and 1961 caused a leading authority to conclude that:

Between insight into a need...and the introduction of a way of meeting the need that is destined for general acceptance...there is typically a lapse of a half century. Another half-century is required for the diffusion of the adaptation. During that half-century of diffusion, the practice is not recognized until it has appeared in 3% of the systems of the country. By that time, fifteen years of diffusion - or independent innovation - have elapsed. Thereafter, there is a rapid twenty years of diffusion, accompanied by much fanfare, and then a long period of slow diffusion through the last small percentage of school systems. ³

Thus it appears that between the introduction of an innovation into the educational system and its adoption by a substantial majority, there is a period of about 35 years; that is, ten times longer than in agriculture! No wonder, then, C.P.Snow observed, with his characteristic acuteness, that:

In a society like ours, academic patterns change more slowly than any others. In my lifetime, in England, they have crystallized rather than loosened. I used to think that it would be about as hard to change, say, the Oxford and Cambridge scholarship examination as to conduct a major ⁴revolution. I now believe that I was over-optimistic.

Nevertheless, we should conclude this section with an optimistic note, for there is some evidence not only that the adoption period has been shortening (some believe that it is now between 15 and 20 years), but that it is possible to shorten it purposely. ⁵ The latter possibility is, of course, what interests

³ Mort, Paul R. "Studies in Educational Innovation from the Institute of Administrative Research: an overview." Chapter 13 in Miles, Matthew B., ed., Innovation in Education. (New York: Bureau of Publications, Teachers College, Columbia University). 1964.

⁴ Snow, C.P. "Miasma, darkness and torpidity." New Statesman, Vol.LXII, August 11, 1961, No. 1587. p.186.

⁵ Miles, Matthew B. "Educational Innovation: The nature of the problem". in Miles, M.B., op.cit., pp. 5-8.

Bushnell, M., "Now we're lagging only twenty years". School Executive, 1957, No-77, pp.61-63.

us here. The first step toward it is, as in any other planning activity, to make a diagnosis of the situation.

II. Why does the educational system lag?

We cannot of course make, in this paper, more than an impressionistic diagnosis of the problem. This is because, first, in our view such diagnoses only have meaning when they have a concrete unit of reference such as a nation, region or school. Secondly, and perhaps more important, in spite of the hundreds of studies done on the subject, the fact remains that we do not know enough to generalize the findings in a normative model. We have standards for judging how fast or slowly a certain educational innovation is being diffused. But we know this only for the developed countries. Moreover, it seems that the subject is much too complex to be reduced to this single variable. Obviously, we are interested in the end product, adoption, but we also want to know how to influence it, -- that is, how to accelerate the diffusion of an innovation. It seems to be here that the situation is more hazy. Mort, for instance, after reviewing some specific studies aimed at discovering how to improve adaptability (i.e. innovativeness) of school systems, concludes that:

1. "There is no single factor, in and of itself, which is highly related to adaptability."
2. "Differences in the complexes of factors making for adaptability among communities are so great as to obscure the relative influence of a particular condition or policy; these differences cannot be ironed out sufficiently by traditional methods of matching by community size, wealth, and expenditure levels."⁶

⁶ Mort, P.R., op.cit., pp.321-322.

However, enough research has been done in the field of diffusion of innovations to allow an attempt at making a normative scheme of how an innovation, --that is, an idea perceived as new by an individual or group, -- gets to be accepted.⁷ But first, since there is some controversy on the matter, we must distinguish between innovation and invention. The latter is the creation of the new idea, which is not only quite a different process but also less known and more subject to randomness, though by no means uncontrollable. Let us first focus on this matter.

In the previous section it was stated that there is typically in the education system, between the recognition of a need and the introduction of the idea to meet it, a lapse of half a century. Is this too long a period? This is a matter which is extremely difficult to assess. Indeed, some authors maintain that it is not possible to determine when a single invention begins or ends.⁸ However, if we are thinking in terms of the need that a system like education (especially in the developing countries) has for self-renewal, 50 years certainly seems too long a period, and all the more so as we compare

⁷ See, for instance, Rogers, E.M., op.cit., esp. Ch.II and XI; Katz, E. and Levin, M.L., "Tradition of Research on the Diffusion of Innovation," American Sociological Review, 28(April '63), 237-52.

⁸ See, for instance, Hamilton, W. and Till, I. "What is a Patent?" Law and Contemporary Problems, 13,2.

it with the pace of inventions in other areas, especially in industry, "where the time lag between a technical discovery and recognition of its commercial use was: 30 years before World War I, 16 years between the wars, and only 9 years since World War II."⁹ Why is this so?

The answer appears to be rather straightforward: almost no educational system has developed a systematic means of self-appraisal and inventing. Even at the university level, institutional research is a rather new activity, although it is true that in the last ten years it has expanded rapidly.¹⁰ Even in the most advanced countries, the process of educational invention and innovation is left to little less than chance. Quite a contrasting picture is the one that exists for other fields such as health, agriculture or industry. Perhaps it suffices to mention that in a country like the United States, while less than one tenth of one percent of the resources of public education are spent in research and development, in some industries such as electronics and chemicals the expenditure amounts to twenty per cent.¹¹ The situation in the developing

⁹ Bennis, Warren G. "The Coming Death of Bureaucracy." *Think*, Nov.-Dec. 1966. p.32.

¹⁰ Rourke, Francis E. and Brooks, Glenn E. The Managerial Revolution in Higher Education. Baltimore: The Johns Hopkins Press, 1966. pp.44-67.

¹¹ Bruner, Jerome, "The New Educational Technology", *The American Behavioral Scientist*. Vol. VI (Nov. 1962) no.3, p.5.

countries seems to be worse because even the side effects of industrial inventions are apparently absent.

But if expenditures are crucial for advancement of research and development, there is evidence that suggests that, in the educational system, availability of resources may not be as important a factor in the diffusion of innovations as it is, say, in agriculture.¹² In the adoption of an innovation there are many other factors which are, perhaps, more crucial to the outcome of the diffusion process. First of all there are the influences emanating from the general state of the system or society; second, those from the educational system itself; third, the characteristics of the relevant actors of the organization; fourth, the characteristics of the innovation itself, and last but not least, the communication process. Rogers has summarized the way in which these factors affect the adoption process.¹³ Figure 1 is an attempt to present his conclusions succinctly. In the first place, notice that the adoption process proceeds by stages. Typically, the time elapsed between the stage of awareness (when one first hears about the idea) and that of trial is longer than between trial and adoption. However, these lapses vary according to the type of adopters. Thus, for instance, the early adopters quickly reach the trial period, but it takes longer for them definitively to adopt the idea. The crux of the matter is, then, what makes an individual an early adopter? And what influences the length of the adoption period?

¹²Carlson, Richard O. "School Superintendents and the adoption of modern math: a social structure profile", in Miles, M.B., ed., op.cit., p.340.

¹³Rogers, Everett M., op.cit., p.306.

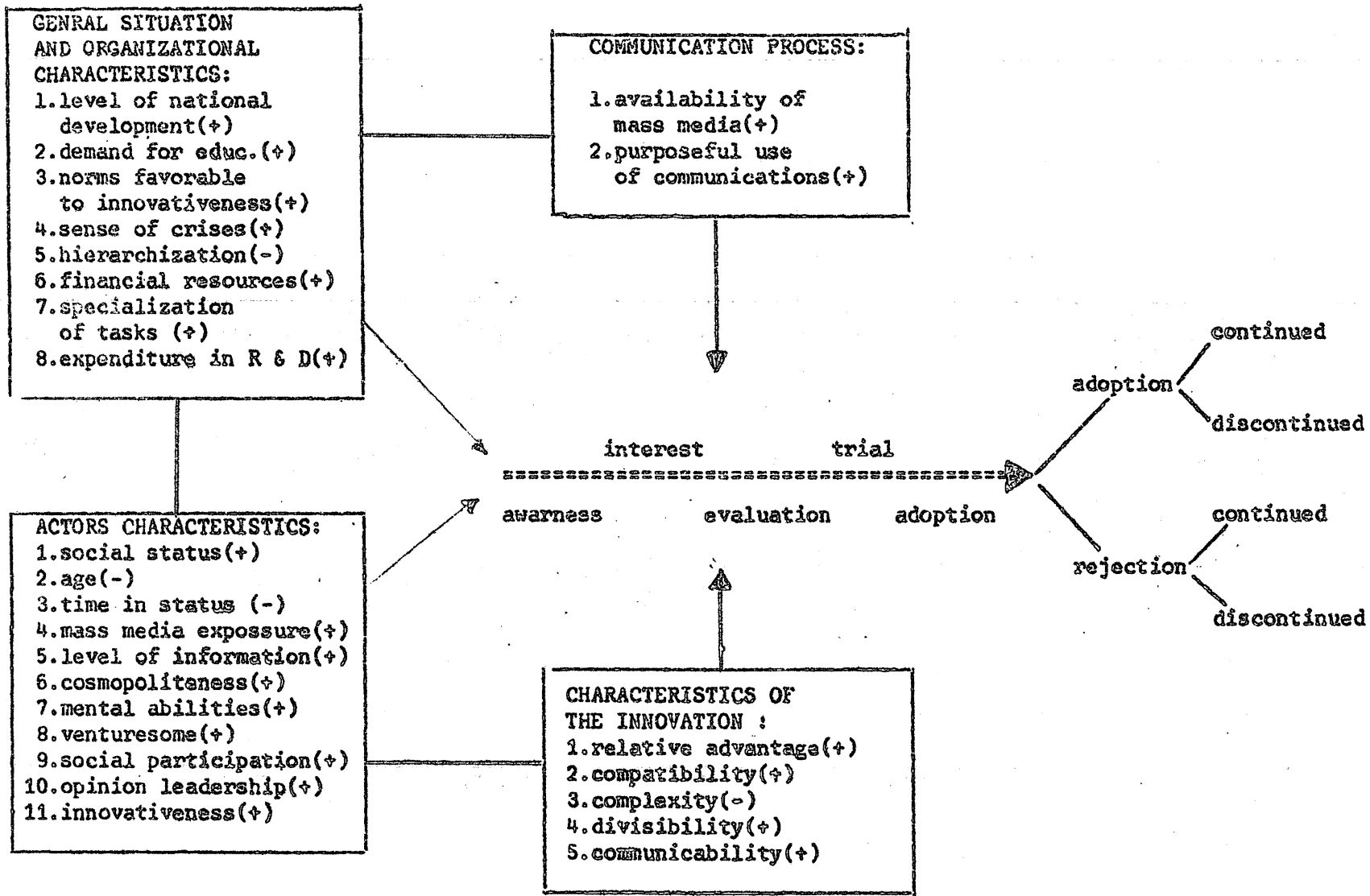


FIGURE 1

MODEL OF DIFFUSION OF INNOVATIONS

If we look at the box of actors we will see that an early adopter is likely to be a young person, of high status (education, income and prestige), new to the position he occupies in the organization, highly exposed to mass media, well-informed about the subject through a variety of technical and other means . Apart from these background characteristics he is also likely to possess mental abilities such as a capacity for abstract reasoning, a sophisticated style of evaluation, and intelligence. Most likely he will be "modern" in his attitudinal orientation including, of course, a predisposition toward risk-taking, accepting the new or, in short, innovativeness. He also will tend to be a socially participant person and opinion leader, that is, he not only will interact more, but his opinions will be most influential in forming the opinions of others. However, a word of warning is in order here. These characteristics are not necessarily related linearly to the adoption process. Some of them have more influence in certain stages than in others. For instance, while impersonal and cosmopolite information is more important in the awareness period, at the evaluation stage it is contact with personal and localite sources of information that is more effective in bringing about a final adoption.

The Actors At this point we may ask, how do educators rank in all these characteristics? A proper evaluation of this question will require data not only for educators, but also for some other groups such as businessmen, workers or peasants.

Fortunately, we have been able to collect some relevant data, although it refers only to one country: Venezuela. A brief glance at Fig. 2 reveals that, contrary to what one may have been led to believe, educators are quite innovative, even when compared to executives of such a modern industry as the oil industry. The average Venezuelan educator, when compared to other groups of the population, approaches the idealized description of the innovator. (see Appendix A) Venezuela, it is true, is a country that has changed very fast in the last 30 years, and this might have boosted the attitudinal modernism of educators. However, some comparable data collected for Chile - a society which, by the time the data was collected (1961), had been stagnant for almost a quarter of a century - suggests the same conclusion. As may be seen in Table No.1, the Chilean educator has levels of political efficacy and political participation comparable to those of the Venezuelans, and we should remember that it is generally accepted that these indices are all strong correlates of modernism.¹⁴ However, even a casual acquaintance with the educational systems of these countries is sufficient to conclude that they are not more innovative than those of any other Latin American country.

¹⁴ Smith, D.H. and Inkeles, A. "The OM Scale: A comparative socio-psychological measure of individual modernity." *Sociometry*, Vol. 29, No. 4, Dec. 1966.

Almond, G. and Verba, S. The Civic Culture. Cambridge (Little, Brown and Co.). 1965.

Lerner, D. The Passing of Traditional Society. New York: (The Free Press of Glencoe), 1964.

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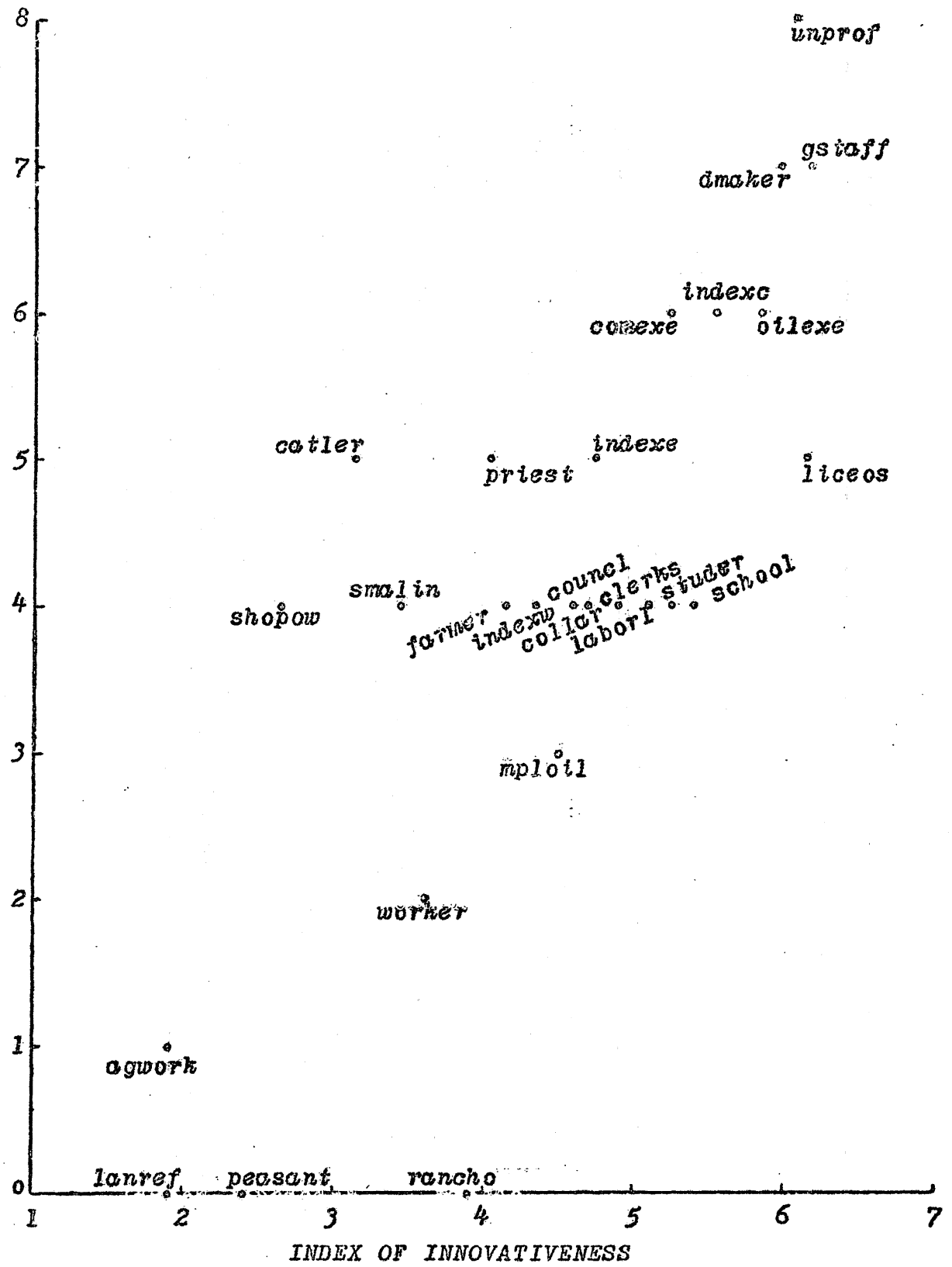


FIG. 2. SOCIO-ECONOMIC STATUS AND INNOVATIVENESS IN SOME VENEZUELAN GROUPS.

(see Appendix A)

TABLE NO. 1.
POLITICAL EFFICACY AND POLITICAL
PARTICIPATION AMONG CHILEAN AND VENEZUELAN EDUCATORS

	Feel Politically Efficacious	Discuss Politics	Attend Professional or Union Meetings	Worked Actively in Politics	Participated in Street Rally or Demonstration
	%	%	%	%	%
CHILE:					
Primary (N=193)	22	24	77	8	44
Secondary (N=201)	25	33	71	9	38
Catholic Univ. (N=75)	23	51	45	8	16
Univ. of Chile (N=76)	13	37	68	10	22
VENEZUELA:					
Primary	20	52	70	13	26
Secondary	26	72	73	20	27
University	29	87	82	16	23

SOURCES:
Silvert, K.H. and Bonilla, F. Education and the Social Meaning of Development.
New York: (American Universities Field Staff), 1961. p.220, 223.

CENDES, Universidad Central de Venezuela: Estudio de Conflictos y Consenso:
Serie de Resultados Parciales. Vol. 2 and 3. Caracas: (Imprenta Universitaria), 1966.

The usual complaints that the educational system is conservative, that it uses stone-age teaching methods and that it is not keeping up to date with the technological revolution are heard as often in these countries as in other developing countries of the world. If the educators are no less prone to innovation than, say, industrial managers or executives, why then does the educational system lag? It is true that, in spite of the inroads

that developmental influences have made in the attitudinal map of educators, they still hold a somewhat platitudinous orientation toward the role of education itself. For instance, as may be seen in Table No. 2, the majority of Chilean educators, and an overwhelming proportion of Brazilian secondary school teachers, still cling to the rather vague idea that "education should strive, first and foremost, for the full development of the individual; (and that) any other objective will be secondary." Consonant with this data we also see that few Venezuelan and Chilean educators, and still fewer Brazilian secondary school teachers, believe that

TABLE NO. 2

EDUCATION AND ECONOMIC DEVELOPMENT

Main Goals of Education	CHILE				BRAZIL			
	Primary N=193 %	Secondary N=201 %	Cath.Univ. N=82 %	Univ.of Chile N=85 %	Rio Gr. do Sul N=230 %	Sao Paulo N=152 %	Ceara N=139 %	Para N=72 %
Meet national economic development need	11	14	13	29	3	2	9	9
Protect the individual from bad side effects of economic development	17	11	5	9	4	7	5	8
Fully develop the individual	68	71	75	59	92	84	83	81

Sources: Silvert, K.H. and Bonilla, F. *op.cit.*, p.215 ; Table CH-XIX.

Gouveia, Joly Aparecida, "Education and Development: Opinions of Secondary School Teachers", in Lipset, S.M. and Solari, A., eds., Elites in Latin America. New York: (Oxford University Press). 1967. p.496.

the main function of education should be to give technical and professional training. (see Table No. 3) However, no easy inferences can be made from this information about the predisposition of educators to innovate. Yet it does suggest to us the hypothesis that, in educators, values about education are more difficult to change than, say, political values.

TABLE NO. 3
MAIN FUNCTION OF EDUCATION

COUNTRY and GROUP	Percentage answering that the main function of education should be:		
	Prepare good citizens	Give technical and professional training	Form Men of Culture
BRAZIL(males):			
Rio Gde.do Sul:			
Secondary(N=225)	21	13	18
Normal (N=47)	15	9	23
University(N=167)	14	10	18
Sao Paulo:			
Secondary(N=140)	15	12	29
Normal (N=40)	15	15	15
University(N=90)	13	9	21
Ceará:			
Secondary(N=119)	29	17	23
Normal (N=49)	20	14	6
University(N=16)	25	6	13
Pará:			
Secondary(N=70)	22	11	19
Normal (N=19)	5	5	37
University(N=14)	14		29
CHILE:			
Primary (N=193)	34	42	4
Secondary(N=201)	40	28	13
Cath.Univ.(N=82)	29	28	25
Univ.of Chile (N=85)	21	40	21
VENEZUELA:			
Primary (N=202)	50	37	9
Secondary(N=183)	41	48	3
University(N=190)	39	45	6

A clearer picture of our subject matter emerges from the data presented in Table No. 4. In Chile, the main problems that educators perceive are those related to the organizational aspects of their work. The main complaint of Chileans about their work conditions is the lack of material resources and the low pay scales; but they also give saliency to an alleged lack of vocation, and failure to keep up to date in subject matter, in their colleagues.

TABLE NO. 4
PROBLEMS OF THE TEACHING PROFESSION AS PERCEIVED BY CHILEAN EDUCATORS

Considers "very important" the following factors in making the teaching profession in Chile difficult, as well as in other countries:	Primary (N=193) %	Secondary (N=201) %	Catholic Univ. (N=75) %	Univ. of Chile (N=76) %
Lack of material resources	77	83	59	54
Low pay scales	72	82	55	64
Few opportunities for promotion	50	49	19	25
Incapacity of administrators	35	28	20	22
Intrusion of party politics into education	39	48	55	37
Lack of co-operation from parents	54	46	20	21
Lack of vocation for teaching	60	55	56	46
Failure to keep up to date in subject matter	56	54	61	53
Lack of direct contact with students	34	32	36	30
Lack of unity within the profession	34	31	12	20

Source: Silvert, K. and Bonilla, F., *op.cit.*, p. 205-207.

At this point the reader should be reminded that Chile is usually considered, among Latin American nations, as one having an advanced educational system. Moreover, the universe from which these samples were drawn comprises the most privileged institutions of the Chilean system. Unfortunately, we do not have exactly comparable questions for Venezuelan educators. However, we did ask them about the problems that most worried them concerning their work.

As may be seen in Table No. 5, the majority of Venezuelan educators are worried mostly by organizational types of problems. Among these, the most prominent factors are those related to the quality of education and motivational state of both students and teachers. As a university professor put it: "I notice a lack of dedication to study, both on the side of the students and of the professors."

TABLE NO. 5

EVALUATION OF OCCUPATION BY VENEZUELAN EDUCATORS

EVALUATION	Primary (N=202) %	Secondary (N=183) %	University (N=190) %
Bad working conditions or economic problems	29.2	26.2	29.5
Motivational and qualitative problems	45.6	51.4	50.0
Political		2.7	4.2
Others			
No problems	17.8	12.0	10.5
Positive:			
What likes most about present occupation is the psychic satisfaction	72.7	58.4	64.7

Source: CENDES, op.cit.

A less balanced opinion was more frequently expressed by teachers

at the primary and secondary level. Typical among them was the professor of a teachers' college who emphatically said that what worried him most was that "the boys each time come worse prepared and they register in the normal school (teachers' college) without having a vocation for it." Less prominent, although salient enough to worry almost a third of the educators, are the economic problems of the schools. Lack of appropriate budget is the most frequent complaint of this type heard at all levels of education. Except for quite a few primary school teachers who mentioned that it was the poverty of the pupils that worried them most, the rest, in one way or the other, paraphrased the teacher who said that he was worried by "the lack of appropriate facilities: equipment, books and methods." Nevertheless, it seems that these problems are not acute enough to alienate the educators because most of them, when asked what they liked best in their present occupation, answered without hesitation that it was the teaching of some specific course or that teaching itself was gratifying. As a primary school teacher put it: "To feel the satisfaction that students are learning and getting through." (see Table No.5)

What, then, can we conclude from this data? Indirectly this evidence points to a very important fact: educators are not usually concerned with innovating in their own system. We derived at random a sub-sample of 20 questionnaires from each sample of educators, and thoroughly checked their responses. Only one, a professor from the Institute for secondary school teachers (Instituto Pedagógico Nacional), mentioned that what

worried him most was "the difficulty of advancing the reform of the secondary studies." This brings us back full circle to the problem stressed at the beginning of this section of the paper: lack of a capacity for self-appraisal as a crucial explanatory factor in the lag of the educational system, with regard to the adoption period of innovations. How can an organization reform itself if it does not have a systematic way of being evaluated, and if most of its members are not oriented toward self-evaluation?

Situational and organizational barriers.

Another suggestion comes out of the opinions of educators: many of them feel that there are important administrative problems that hamper their work. This, of course, is nothing new. More recently in the developing countries, but in fact ever since Max Weber's theory on bureaucracy became accepted as a norm, we have been hearing over and over again that an administrative reform must be performed with the specific purpose of establishing:

1. "A well-defined chain of command
2. A system of procedures and rules for dealing with all contingencies related to work activities.
3. A division of labor based on specialization.
4. Promotion and selection based on technical competence, and
5. impersonality in human relations."¹⁵

Certainly something along this line is needed for an organization to function effectively, but evidence begins to pile up pointing to other factors as important explanatory variables of job dissatisfaction and inefficiency. In Venezuela, for instance,

¹⁵Bennis, W.G. "The Coming Death of Bureaucracy", Think, Nov.-Dec., 1966, pp. 31-32.

it has been shown that a substantial proportion of high-ranking government officials (among which are included officials from the Ministry of Education) are planning to leave their jobs in the near future, mainly because they are subject to a complex set of psychological pressures which most likely will increase rather than decrease if an administrative reform is carried out.¹⁶ The experience of the larger corporations in developed societies is also relevant here. As a specialist on organizations recently put it, "there are four ~~referatréhozobé~~ threats to bureaucracy:

- (1) Rapid and unexpected change.
- (2) Growth in size where the volume of an organization's traditional activities is not enough to sustain growth.
- (3) Complexity of modern technology where integration between activities and persons of very diverse, highly specialized competence is required.
- (4) A basically psychological threat springing from change in managerial behavior."

We cannot say that the educational system, as a large bureaucracy, is experiencing all of these threats with the same intensity. Rapid growth is perhaps the main challenge of the educational bureaucracy nowadays; the rate of change of the educational system (as measured by the reduction of the adoption period of innovations), in spite of its evident lag when compared to other activities, is certainly being accelerated to such a point as to lead a prominent U.S. educator to believe that "historians of the future could mark

¹⁶ Silva Michelena, J.A. "The Venezuelan Bureaucrat" in Bonilla, Frank and Silva Michelena, José A., eds., Strategies of Research and Social Policy, Vol. I of the Politics of Change in Venezuela. Cambridge: (M.I.T. Press), 1967, (forthcoming).

this era as the beginning of a technological revolution destined to sweep through the entire educational system of America."¹⁷ Exaggerated as this statement may seem, it warns us that, perhaps sooner than we expect, education will become a more and more complex activity where limiting the variety of specialists, as is largely the case now, will be suicidal. This observation, of course, goes against one of the most widely preserved principles of any educational bureaucracy: that education is for educators. Perhaps it is already time to paraphrase the old dictum usually applied to wars and generals: education is too important to be left to the educators alone.

Aside from these general and still somewhat vague factors, there are some administrative peculiarities about the educational organization that make it especially innovation-resistant. It is a current principle of administrative theory that the more centralized, the more hierarchical, and the more "permanent" the structure of an organization, the less likely that an innovation will be adopted.¹⁸ In most Latin American countries such is precisely the situation of the educational organizations. The administrative arrangement is usually spelled out in national laws; thus it takes a meeting of the whole National Legislature to make even the most obvious, universally desired changes. In Venezuela, for instance (and the situation is not very different anywhere else in Latin America) graduates of

¹⁷ Finn, James D. "Take-off to Revolution". *The American Behavioral Scientist*. Vol.vi, Nov. '62, no.3.

¹⁸ Griffiths, Daniel E. "Administrative Theory and Change in Organizations." in Miles, M.B., ed., *op.cit.* p.434. See also Bennis, W.G., *Changing Organizations: Essays on the development and evolution of Human Organizations*. New York: (McGraw-Hill Book Co.), 1966, esp. Chs. I, III and VII.

vocational secondary schools could not register in the University because it is so specified in the law, and the Ministry of Education, even wanting to make such a change, could not do anything about it because at that moment (1961-1964) political conflicts were too acute within the National Assembly. Perhaps more extreme is the case of the University Law which states that in order to change the pensa of a given school, approval of the National University Council (an organism integrated by all rectors and government representatives) must be sought. This passion for spelling out in law procedural details is, of course, rooted in the Latin American Spanish tradition duly reinforced by the influence of the Napoleonic codes. Thus it is not an easy normative orientation to change; however, in our view, it is a constraint that can be consciously removed if appropriate efforts are made.¹⁹ Educational administrators, frustrated over and over by the legal "obstacles", may be the first to welcome such changes.

Another organizational peculiarity of the educational system, which also hampers the innovational process, is the lack of economic incentive to adopt innovations. Teachers get paid not for their efficiency or their innovativeness, but for rather particularistic criteria such as length of service, marital status,

¹⁹ The experiments that McClellan and associates are carrying out attempting to modify the n-achievement in adult groups suggest that even deeply-rooted motives may be changed when enough is known about their dynamics. See, for instance, McClellan, D. "The Urge to Achieve". Think, Vol.32, Nov-Dec.1966, No.6. pp. 18-23.

number of children and place of residence. On the contrary, those who venture into innovative enterprises, if they fail, are frequently penalized. Hence, it does not pay to be venturesome. Perhaps these are the reasons that three-fourths of Venezuelan primary teachers, almost two-thirds of secondary school professors and 44 per cent of university professors, when queried in our survey, said that they would prefer "a job which isn't very well paid but with lots of security" over the more daring choices of "a job with average pay and average security" or "a job with high remuneration but without much security". By the same token, when Chilean educators were asked how they felt about competition, more than half of the primary (57%) and secondary (52%) school teachers, and around two-fifths of the professors of the Catholic University (39%) and of the University of Chile (43%) answered that they were indifferent or disliked it. Competition, of course, is a highly contradictory value when applied to education. The opinion of educators is divided on whether it is positive or not, but the fact that competitiveness is a stimulant to innovativeness remains, - at least when linked to profits or other incentives.

We sum up, then, on the basis of the evidence presented here, which, though somewhat fragmentary, seems sufficient to advance the following set of explanatory hypotheses about the innovational lag of the educational system. First, the rather innovative characteristics that educators possess, relative to other groups of the population, are being inhibited if not wasted because of

the rigid and somewhat particularistic organizational structure. Secondly, a key factor hampering innovation in the educational process is the lack of adequate efforts toward self-appraisal on the part of individuals and organizations alike. Third, the almost absolute absence of conscious efforts to diffuse innovations through change agents or other known means of diffusion certainly seems to be a major factor in making the adoption period so painfully slow.

The Innovation itself and the communication process.

There are two other major sets of factors which must be considered in making a diagnosis of the diffusion of innovations in a specific setting. They are the characteristics of the innovation itself and the communication process. However, we shall not consider them in detail here because of their inherent specificity. At a general level, let us just mention that the speed with which a given innovation is adopted is directly related to the way in which adopters perceive the following characteristics: relative advantage, compatibility with other ideas currently being used, divisibility (or degree to which an innovation may be tried on a limited basis) and communicability. Moreover, the adoption period is inversely related to the perceived complexity of an innovation, that is, how difficult it is to learn how to use it.

The communication process is a crucial factor in the diffusion of innovations. It all depends on using the appropriate media at the right moment. As mentioned before, impersonal and cosmopolite communication is most effective in fostering the adoption of an innovation at the awareness and interest stages, but when the prospective adopter comes to consider carefully (evaluate) the possibility of adopting a given innovation, personal and localite sources of information become more effective. Besides, the effects of personal or mass communications on the attitudes of the individual are rather well known: under "normal" conditions they mostly reinforce the predispositions of the individuals. "Normal" here means that the so-called mediating factors are not residual (neurosis, social maladjustments, frustration, anxieties and the like), or that they do not propel toward attitudinal change as in the case of the presence of psychological conflicts (cross-pressures, imbalances or dissonance). Thus, knowledge of the characteristics of the actors of a system can be used to plan effective communication campaigns to induce the acceptance of innovations. This brings us to our final question: how to make the educational organization self-reforming and innovative?

III. Sketch of a Strategy

It seems that the most powerful stimulus for change in the educational system, as well as in many other organizations, is the perception of a sense of crisis. A social revolution creates such a sense of urgency. It has been reported that the sense of "struggle for national survival" which swept the United States after Russia

launched her first Sputnik has been one of the main stimuli accelerating the rate of change in the educational system.²⁰ Such events are, of course, rather occasional and it is platitudinous to say that one cannot wait for a crisis to occur in order to sensitize the government and educators and so to introduce a change. However, we may ask: is there a substitute for the crisis factor? Bureaucracy, we are told, is just about to undergo a thorough revolution. Two key innovations, one social and one technological, are the main pillars of such a managerial revolution: (i) Temporary systems and (ii) the use of computers. Thus, a sound strategy for self-renewal and permanent innovation cannot but be based on these two pillars.

How to innovate?

The effectiveness of the task-force approach can best be exemplified by the well-known case of the Physical Science Study Committee, which successfully revolutionized the teaching of physics in the United States in a period of four years. The Committee's objective was quite clear and limited: to invent, test and revise a textbook, a teachers' guide, laboratory guides and apparatus, films, and tests for a high school course in modern physical science. The work began with a small group of top scientists and eventually it involved some 250 scientists. From our point of interest here, perhaps the best way to show the success of this

²⁰Brickell, Henry M. "State organization for educational change: a case study and a proposal". in Miles, M.B.ed., op.cit., p. 495.

is to mention that although the PSSC limited itself to the invention and revision of teaching materials, and did not therefore make a systematic effort to communicate its plans more widely to teachers, yet in the short periods between 1957-58 and 1962-63 the number of secondary school students using the material jumped from 300 to one-fifth of all secondary school students.²¹

Obviously, this does not mean that all tasks undertaken using a temporary organization approach will have the same success, nor that it is the only way to produce successful innovations. Nevertheless, a mere listing of some of the most salient characteristics of this approach will, perhaps, suffice to make clear its strategic advantages:²²

1. Goals are limited, well-defined and usually in response to a problem rather than a routine operation.
2. Interaction within the group is, in the Durkheimian sense, organic rather than mechanic.
3. Usually the group situation, by freeing persons from the usual constraints of their fixed positions, removes situational or environmental barriers to change.
4. A sense of urgency is ever-present in the need to meet specific deadlines and the knowledge that the group is temporary.
5. It is a rewarding educational experience which not only expands members' technical knowledge and personal contacts with persons of other skills, but also trains participants in the difficult and ever more necessary art of adapting oneself to new groups.

²¹ See Marsh, Paul E. "Wellsprings of strategy: considerations affecting innovations by the PSSC" in Miles, M.B., op.cit. pp.249-267.

²² See Miles, M.B. "On Temporary Systems", in Miles, M.B., ed. op.cit. Ch. 19
Bennis, W.G. op.cit. passim.

6. Finally, as the usual lines of communication between organizations can be bypassed without upsetting the feelings of administrators, access to the outside world becomes easier, and the flow of communications freer. The opportunity for access to new sources of information stirs up a sense of cosmopolitanism and "newism".

A task-force approach, therefore, is the best way to simulate - in a permanent mode - the sense of crisis needed to shake the structure. It not only allows pooling of the best available talents in a specific subject, but also introduces enough flexibility into the organization to unfreeze old practices. Moreover, there is some evidence suggesting that educators are inclined to accept this social invention.²³ For instance, when Chilean educators in an interview situation were told that, among the current tendencies affecting teaching and other professions, were more specialization, more team-work, and more access to the profession; and when they were then asked if they considered these trends to be positive or negative, the overwhelming majority chose the former alternative (see Table No. 7).

TABLE NO. 7

VALUES	WORK-RELATED DEVELOPMENT VALUES*			
	Primary (N=193) %	CHILE Secondary N=201 %	Catholic Univ. N=82 %	Univ. of Chile N=85 %
MORE SPECIALIZATION				
Positive	88	76	74	78
Negative	12	24	26	22
MORE TEAM WORK				
Positive	82	93	91	94
Negative	18	7	9	6
BROADER ACCESS TO THE PROFESSION				
Positive	61	79	91	87
Negative	39	21	9	13

*Respondents were asked to rate as positive or negative a number of "recent tendencies in the teaching profession throughout the world."

Source: Silvert, K. and Bonilla, F. op.cit. p.208.

The use of the task-force approach rather than the normal bureaucratic channels for introducing change is not of course a blue-print for change. In Latin America, many comisiones have either died of sheer inertia or have become reinforcing pivots of the conservative tendencies of the organization. This seems to be the case especially when the goals of the commission touch upon politically hot problems such as public vs. private education. Moreover, it creates new administrative problems which are not so easily solvable. In particular we must mention the need to have special procedures and personnel to coordinate the different temporary organizations. However, no organization is free from the paralyzing effects of politically hot issues; nor is it so impossible to train a core of generalists to serve as effective linking-buffers to the many task-forces that may be in operation. Strategically speaking, the real problem is whether or not the right issues are tackled by the right men.

What to innovate?

It seems to us that a sound strategy for making the educational organization self-innovative must have as its first priority the building of a capacity for self-appraisal, and that this must be done at all levels of the organization: local, regional, and national; primary, secondary and higher. This may seem too ambitious a goal, but the experiences of some community development

²³ An apparently successful proposal for the reorganization of the educational system in the state of New York rested heavily on the use of temporary organizations. See Brickell, H.M. op.cit. pp.511-531.

programs suggest that it is not an impossible task, and moreover that it does not require extraordinary resources, but basically a better use of the existing ones. At the local level there is always present a sense of urgency, - a felt need which, fortunately, is very likely to be easily solvable. Repairs of the school, the creation of a school lunch, even the construction of a new building, are examples of such needs. Our experience is that it requires little effort to involve persons in the solution of a problem if they feel its effects. Such promotional efforts, if there is a community development program in the country, do not even need to be undertaken by the Ministry of Education, although its cooperation is essential. The main pay-off of such activities, aside from whatever tangible output may result, lies not in improving teaching methods or specific educational practices, but in its educative value, for teachers and clients alike, in terms of making them more sensitive to the problems they confront, creating the habit of evaluating their own environment, and doing something about it. As is well known, the diffusion of many educational innovations depends on community involvement. An approach such as the one suggested here also builds up a capacity for working together with other community organizations.²⁴ All of these factors, - capacity for self-appraisal, teacher and community involvement, and the skill of working in teams for the solution of specific problems,

²⁴ We have in mind an operating procedure such as the one employed by the National Community Development Program of Venezuela. For a succinct description of this program see: Venezuela, Oficina Central de Coordinación y Planificación, División Desarrollo de la Comunidad: "Un Nuevo enfoque en desarrollo de la comunidad.", Caracas, junio, 1965.

are essential ingredients for a successful program of diffusion of innovations which may come from the top down.

At a regional level (State or Department) the educational offices and supervisors can be effectively engaged in the tasks of planning, if there is such activity at that level. In the absence of educational planning units at the regional level, I believe that the creation of "research units" at that level may be very fruitful. I am thinking specifically of training supervisors to use the statistical information that they are in any case reluctantly helping to gather, rather than merely relaying it to the statistical office at the national level. There are already available simple models for making diagnoses of the educational situation of an area. The use of such instruments may yield profitable knowledge of the situation above and beyond the personal experience of the supervisor. It is not, of course, a substitute for first-hand knowledge and intuition, but a useful complement to it. Moreover, new methods of evaluation can be designed to meet needs at this level, but this is a task for a higher level of administration.

At the national level, it will be necessary to create an Office of Research and Development. Let us emphatically say that we do not have in mind a new bureaucratic office, but rather an office for the managing of research and the diffusion of innovations. This will be the office which will, so to speak, contract teams of researchers to diagnose complex problems, promoting task forces to invent solutions to these problems. For instance, a much needed tool in the field

of educational planning is a methodology for making qualitative diagnoses of education. This is a typical problem that can be tackled. Another example may be appraising, according to the characteristics, resources and needs of one country, new ideas being implemented in other countries. In other words, making systematic the borrowing of innovations from abroad and making sure they are conveniently adapted according to the needs of the country. A task of the highest priority which this office must get underway is inventing ways of solving those problems that hamper the innovational process, some of which were mentioned in a previous section of this paper. This office must cause those charged with implementation to become involved in such tasks: teachers, supervisors, administrators, students or others according to the specific needs of the task.

This Research and Development Office should also serve as the entrepreneurial unit for diffusing the inventions it helped create or adapt. Two main guideposts must be firmly implanted in relation to this function: (i) no fancy, over-staffed "experimental unit", under-representative of reality, should be created. Such experimental ventures are doomed to be "experimental" forever. Any testing must be done in an environment as close as possible to the "normal" operating conditions of the system. (ii) But before that stage is reached, instruments for making simulations of strategies must be developed. It is in this latter field that computers may be most helpful.

The use of computers

At least at the level of the university, the computer is an innovation that has spread swiftly. In the United States the number of institutions of higher learning using computers has jumped from 5 in 1956 to about 500 in 1964. A recent survey made in that country indicates "that 53 per cent of all state institutions of higher education were using computers for administrative purposes."²⁵ It is true that these machines are primarily being used for managing student affairs, financial administration and physical plant management, and that their potentialities for policy planning are largely being ignored, but a tremendous increase in this latter usage is expected in the near future.²⁶

It is also true that computers are expensive and that many educational organizations in developing countries cannot afford them. However, with the advent of time-sharing systems and the improvement in communications (satellites) it is now possible to pool resources from various governmental departments, universities and even from different countries. Computers, some of them highly sophisticated, already are being used by several Latin American educational organizations. Thus, it seems safe to say that the financial side of the problem is not a great barrier

²⁵ Rourke, F.E. *The Managerial Revolution in Higher Education*. Baltimore: (The Johns Hopkins Press), 1966. p.20.

²⁶ Rourke, F.E. and Brooks, G.E. *op. cit.* pp.20-43.

to the expansion of computer use for educational (administrative, research and teaching) purposes.

This being the case, the idea is to use computers for building complex models of the educational organization, - models which allow one to test several alternative strategies for the diffusion of specific innovations and, on the basis of the results, to be able to choose the best strategy. To choose, that is, the strategy which will assure the optimum results in terms of length of the adoption period and cost. Such models are already being constructed for performing numerical experimentations of a political system, and for simulating the entire economy of nations and of other large and complex organizations, including universities.²⁷ Some of the structural and dynamic elements for building a model of the diffusion of innovations in an educational system are contained in section II of this paper. Figure 1, in fact, may be interpreted as a rough flow diagram of the model. Such a model, of course, has to be based on data that can easily be provided by research projects undertaken by the Office of Research and Development. At first, let us be quite clear, the model will not be predictive. However, as knowledge of the subject of study increases, and as an overtime data bank begins to build up, it will soon become possible to predict, within specified error limits, the likelihood of success of a given innovation (i.e. its probable adoption period) if an apriori specified strategy is followed.

²⁷ Silva Michelena, J.A. "Venutopia I: an experimental model of a national polity." in Bonilla, F. and Silva Michelena, J.A. op.cit. ch.XII. Simulmatics Corporation: Dynamic Models for Simulating the Venezuelan Economy. Mimeographed. Sept. 1966.

An office such as the proposed must be located at the highest echelons of decision-making within the educational organization. Ideally it may be located within, or side-by-side-with, the educational planning unit. This, however, will require that planners overcome the common fear of helping to bring to life the creatures they themselves conceive. By no means does this imply that planning agencies must become involved in the implementation of plans. It only recognizes openly something that is happening more and more, even at the national level, that is transforming the plan into a planning activity.

In summary, then, we would like to suggest that the building into the educational organization of a mechanism for continuous reform and innovation rests in the skillful use of temporary organizations for inventing and of computer simulations for devising and assessing sound strategies for innovating; and in making deliberate efforts to implement these strategies.

APPENDIX A.

TABLE A.

SOME CHARACTERISTICS OF VENEZUELAN GROUPS.

GROUPS	INNOVA	AGE	SES	EDGOAL	TIMJOB	ATTMOD	NORISK	WORDOM	POLPART
GSTAFF	6.2	37.0	7.0	14.0	36.8	6.0	48.7	5.0	4.0
UNPROF	6.1	36.0	8.0	38.4	45.3	7.0	44.2	5.0	5.0
LICEOS	6.1	34.0	5.0	42.6	48.1	6.0	61.8	5.0	5.0
DMAKER	6.0	38.0	7.0	7.1	34.3	7.0	42.4	6.0	6.0
OILEXE	5.8	37.0	6.0	43.8	45.5	5.0	57.1	5.0	3.0
INDEXC	5.5	36.0	6.0	47.8	41.5	6.0	51.6	5.0	2.0
SCHOOL	5.4	29.0	4.0	38.1	36.6	6.0	75.3	5.0	4.0
LABORL	5.2	38.0	4.0	24.5	47.7	7.0	73.2	7.0	9.0
COMEXE	5.2	39.0	6.0	47.7	48.3	6.0	54.0	5.0	2.0
STUDER	5.1	23.0	4.0	-	49.8	7.0	56.9	7.0	7.0
COLLAR	4.9	28.0	4.0	23.9	49.4	5.0	69.4	4.0	1.0
INDEXE	4.7	37.0	5.0	21.1	57.9	5.0	52.6	6.0	2.0
INDEXW	4.7	37.0	4.0	36.4	40.9	4.0	54.6	5.0	1.0
CLERKS	4.6	31.0	4.0	27.9	42.9	6.0	72.9	4.0	2.0
MPLOIL	4.5	37.0	3.0	61.1	41.2	5.0	75.4	5.0	2.0
COUNCL	4.3	39.0	4.0	23.0	44.1	6.0	77.6	7.0	7.0
FARMER	4.1	38.0	4.0	74.1	27.0	5.0	59.2	5.0	3.0
CATLER	4.1	41.0	5.0	79.2	37.1	5.0	67.4	6.0	2.0
PRIEST	4.0	39.0	5.0	31.6	25.4	6.0	-	6.0	1.0
RANCHO	3.9	32.0	0.0	26.0	20.2	4.0	80.5	3.0	0.0
WORKEW	3.8	30.0	2.0	26.4	26.4	4.0	74.7	4.0	1.0
WORKEC	3.6	30.0	2.0	17.5	23.8	4.0	69.8	5.0	2.0
WORKEE	3.6	30.0	2.0	23.8	29.1	5.0	65.8	4.0	1.0
SMALIN	3.4	42.0	4.0	59.0	36.5	5.0	45.0	5.0	2.0
SHOPOW	2.6	37.0	4.0	50.3	33.5	5.0	52.0	4.0	0.0
PEASAN	2.4	37.0	0.0	58.8	17.6	2.0	53.9	4.0	2.0
LANREF	1.9	40.0	0.0	49.2	15.2	2.0	60.7	4.0	3.0
AGWORK	1.9	35.0	1.0	55.6	14.2	3.0	70.4	4.1	1.0

I. EXPLANATION OF VARIABLES:

- (1) Average age (AGE)
- (2) Index of Socio-Economic Status (SES) as measured by number of years of education, monthly personal income and occupational prestige. This and all other indices are ordinal measures ranging from zero (0) to ten (10)
- (3) Time in Present Job (TIMJOB): Percent who claimed to have held their present job six or more years.
- (4) Technically oriented: (EDGOAL) Percent who mentioned that the main function of education should be to capacitate youth professionally and technically.
- (5) No Risk-taking (NORISK): Percent who said that they would prefer to have a job that was not well-paid but had lots of security.
- (6) Index of attitudinal modernity (ATTMOD): Composite with indices of mass media exposure, level of information, nationalism and political efficacy.
- (7) Index of innovativeness (INNOVA): belief that to prosper in work one should introduce new methods or acquire new habits and that to "new problems new solutions must be given."
- (8) Index of personal contacts (WORDOM): Frequency of personal contacts with armed forces officers, big businessmen, peasants, workers, labor leaders, student leaders, policemen, foreigners and political leaders.
- (9) Index of Political Participation (POLPART): Participation in political party meetings, professional or union meetings, discuss politics with friends or acquaintances, worked actively for a party or candidate.

II. Data was gathered in 1963 as part of the Conflict and Consensus Survey. For a report on this survey see: Bonilla, F. and Silva-Michelena, J.A. Strategies for research on Social Policy, Vol. 3 of The Politics of Change in Venezuela. Cambridge: (The M.I.T. Press), 1967. (forthcoming)

III. Full description of groups (SEE NEXT PAGE).

KEY FOR IDENTIFYING SAMPLE GROUPS

GSTAFF	Government staff
UNPROF	University professors
LICEOS	Secondary school teachers
DMAKER	Government decision makers
OILEXE	Oil industry executives
INDEXC	Executives of large industrial companies (central region)
SCHOOL	Primary school teachers
LABORL	Labor leaders
COMENE	Executives of big commercial enterprises
STUDER	Student leaders
COLLAR	White collar workers in big commercial enterprises
INDEXE	Executives of large industrial companies (eastern region)
INDEXW	Executives of large industrial companies (western region)
CLERKS	Government clerks
MPLOIL	Oil industry employees
COUNCL	Municipal council members
FARMER	Commercial farmers
CATLER	Owners of cattle ranches
PRIEST	Priests
RANCHO	Rancho inhabitants
WORKEW	Industrial workers (western region)
WORKEC	Industrial workers (central region)
WORKEE	Industrial workers (eastern region)
SMALIN	Owners of small industries
SHOPOW	Small shop owners
FEASAN	<u>Traditional campesinos</u>
LANREF	<u>Land reform campesinos</u>
AGWORK	<u>Agricultural workers</u>