# HOW TO PROMOTE THE NECESSARY TRANSITION FROM FORMAL TO NON-FORMAL EDUCATION IN A CONVENTIONAL CLASSROOM: AN EFFECTIVE STRATEGY FOR SCIENCE TEACHING

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## ABSTRACT

A rather extensive literature currently emphasizes how inadequate formal systems are to meet – effectively and efficiently – the needs of individuals and of the society. The need of offering more and better education at all levels to a growing number of people, particularly in developing countries, and the scant success of current formal systems to meet such demands have stressed the urgent need of providing alternatives apart from formal standards. In educational literature, the study of alternative education systems often mentions "formal education", "non-formal education", "informal education", among other terms, and one can easily verify the absence of consensus as to the meaning of each of those concepts, and that most efforts regarding the promotion of the transition towards the so-called "non-formal education" do not produce the expected results, and frequently fail. This paper shows that the reasons for this failure could be related to: (a) the concept of non-formal education usually adopted, and (b) the way this transition is carried out. In order to solve some of the problems that arise, (a) a new classification proposal is presented, comprising formal, non-formal and informal education, their new characteristics and relationships, and (b) a flexible model for the transition from formal to non-formal education is shown, where this transition takes place gradually and "continuously". Looking for a solution for our current science teaching problems, concrete examples of creation of non-formal systems and their perspectives are also presented.

## HOW INADEQUATE IS FORMAL EDUCATION?

Formal Education is the general designation of the education model usually carried out in our schools and universities. Structured and administered according to a relatively rigid set of laws, precepts and procedures, and transmitted through a quite inflexible curriculum as to objectives, contents and methodology, its basic characteristic, as remarked by Holmberg (1981), is the "presential" nature of teaching, which is based on the physical presence of the student inside the classroom, close to the teacher. It presents a minimum programmatic content to be developed by the teacher within a certain period, usually by means of expositive methodology, just scarcely interactive, rarely planned aiming objectives established either by the teacher or by the educational system. It can be remarked as well that, in most cases, the assessment system adopted by the formal education, rather than aiming the improvement or the control of the educational process as a whole, pursues no other objectives but those of administrative nature.

In general, the planning and the accomplishment of formal education systems just very seldom will effectively take into account the student's profile as to previous existing knowledge and motivation levels, standards and values which might be relevant to determine both the efficiency and the efficacy of the process – failures are usually ascribed to the student, not to the system. It is also remarkable that the very same poor and just barely creative methodology is implemented in formal education no matter how many students attend classes – either 10, 50 or 200 – and, in most cases, basic scientific knowledge of the teaching/learning process is not taken into account.

The teacher is at the core of the formal education process, and all is planned and executed by emphasizing his/her activities and the rules established by the education system – in general, relevant factors which may influence the process are left to a second level, such as the characteristics and the real needs of the student and of the society. The most severe critics of formal education use to remark that this education model stresses more strongly **teaching** than **learning**, is much more concerned about the **programmatic content** than about **learning** itself, is more attentive to the **teacher's** than to the **student's** activities.

On the other hand, formal education cohabits with the most different myths and beliefs – the persistence of formal teaching models is revealed in many different ways, such as the belief that the teacher is the protagonist of the educational act; the belief that assessment results reflect the student's real learning level; the general assumption that teaching requires nothing but being acquainted with the subject, and that learning requires nothing but listening and taking notes; the usual concept that the Gaussian distribution of assessment results corresponds to an excellency standard to be achieved in a school disconnected from reality and from life (Dib, 1994). Some intellectuals dedicated to the educational process do even refer to the existence of an "educational mythology" permeating the entire process, remarking that formal education cannot mask how apart it is from the real needs of the student and of the society.


## LOOKING FOR AN ALTERNATIVE TO FORMAL EDUCATION

Several educational systems can be found under the label of "non-formal education", aiming ultimately to offer options to the worn-out formal model. Among these we can recall, for instance, "distance learning", "correspondence school", "open systems", "non-conventional education", "informal education". Despite the absence of consensus as to their meanings, such systems constitute alternatives to the formal model, and are created and implemented producing largely different results, comprising from great successes, such as, for instance, the "British Open University", to a significant number of nonsuccessful experiments, some of which have been finally abandoned.

If the reasons for so unequal results are to be understood, a concept of non-formal education must be previously established, allowing thus to comprise all the different existing educational systems enclosed under that label. Secondly, all the strategies usually adopted in order to implement those systems must be carefully analyzed. However, establishing clearly and objectively the basic characteristics of non-formal education is not an easy task. As remarked by Ward and collaborators (1974), "A comprehensive and standard definition of non-formal education is not yet available in common usage. Perhaps such a definition will not emerge until after much more study of the educational issues and potentialities inherent in the variety of experiences now called non-formal education has been done". Nevertheless, according to these authors, even a preliminary analysis of the existing non-formal systems reveals, in general, the presence of two basic elements: (a) a process centered on the student's needs and characteristics;

and (b) the immediate applicability of the education regarding his/her personal and professional development.

Concerning the creation and implementation scheme usually  adopted, it comes out that, in general, the non-formal system is introduced independently from existing formal institutions. In most cases, a new non-formal institution is created, presented as being meant to replace the formal institution, thus creating an unnecessarily competitive atmosphere among the institutions, instead of a cooperative scheme. On the other hand, no matter how desirable and needed the transition from formal to non-formal model may be, the way it usually is carried out − by "jumps" – does not seem to contribute to a successful transition.

Undoubtedly, the poorly flexible concept of non-formal education and the way the implementation of non-formal systems is usually carried out are partially responsible for the many failures registered in this field. An alternative proposal to the existing one will be presented later on, together with the suggestion for a "smooth" transition from formal to non-formal model, based on a new concept of non-formal education. First, however, and though briefly, the concept of informal education must be reanalyzed.

## CLASSIC CONCEPTUALIZATION OF INFORMAL EDUCATION

Informal education is significantly different from formal education, and particularly from non-formal education, though sometimes it may reveal a very close relationship with both models. First, informal education does not correspond to a systematic and organized educational approach. Therefore, it does not usually consider objectives and programmatic contents comprised in traditional curricula. It is intended to students as well as to public in general, releasing them from any sort of obligation, no matter which theme is being considered. Usually, there is no control on the student's performance, and no degrees or certificates are delivered. Informal education's basic function is solely supplementary, adding to formal and non-formal education.

Among the many kinds of activities enclosed by the informal education, the following may be underlined: (a) visiting museums, expositions and scientific fairs; (b) attending to educational, cultural or scientific programmes on radio or TV; (c) reading scientific, cultural, technological, educational releases on papers and magazines; (d) attending lectures, conferences, round tables on science, culture, education, etc.

It is worthy to remark that no one can assert forehand whether one certain educational activity fits formal, non-formal or informal domain. For instance, visiting a science museum may be considered an example of informal education if the student takes the initiative of going to the museum, and if the activities carried out are not related to his/her school activities. However, if the visit is part of activities related to school curricular program, thus requiring the student to make observations and to produce a report to be submitted to the teacher's assessment, it will probably be an activity associated to formal education, rather than to non-formal education. The relationship between formal, non-formal and informal education will be analyzed from a new non-formal education model, which will be presented next.

# A NEW CONCEPTUALIZATION AND A NEW TRANSITION STRATEGY

As we have seen, formal education presents a set of quite clearly defined characteristics. According to Dib (1988), if for any reason one of these characteristics is suppressed, the new system should be considered "less formal" than the former one. Thus, for instance, if the "presential" character is absent most of the time, the new system becomes "less formal" than the former one, and one can assert that it gets apart from the original formal system. In this new system, contacts between teacher and student occur less frequently, and part of the activities may take place out of the classroom, or even out of the institution, for instance, at the student's place. If moreover another characteristic is equally suppressed – for instance, if the system now presents more flexible curriculum and methodology, so as to meet individual differences possibly existing – the new system will get even more distant from the original formal system. Each time a formal characteristic is suppressed, the new system gets a little farther away from the original formal system.

Therefore, starting at an initially formal system, we may have, by means of the gradual suppression of its formal characteristics, a set of systems lacking one or more characteristics of the original one. We will designate them all **non-formal systems**. According to the number of formal factors lacking, we may have different degrees of non-formal systems. From the exposed, we may define **non-formal education** as the education system lacking one or more characteristics of the formal education. Thus, we can figure out the possible existence of a kind of "continuity" on the transition from one formal system to non-formal systems, by means of the gradual suppression of formal factors. The model proposed opposes to the traditional transition model by means of "jumps" from formal to non-formal.

Similarly, the model proposed suggests it to be equally possible to start at a non-formal system and to move towards an informal system, by means of the gradual suppression of some formal factors still present in the non-formal system; for instance, when students are given a certain autonomy as to the election of themes, objectives, methodology, as well as to the moment when they are supposed to develop each of the activities planned, and to the length of time left to each item of the programme.

It is quite easy to notice that the more precepts and organization the informal education keeps in its activities, the closer it will be to non-formal education. This equally suggests the possibility of transition from informal education to non-formal education by including one or more formal factors, and from this one to formal education, again by including formal factors. The direction the transition will take among the three education systems will depend on the decision adopted as to the suppression or inclusion of formal factors into the original model considered. This model has been favorably accepted by experts in this area, specially Wheeler, physicist dealing with informal education, who remarked: "Dib created an important structure that can be used to attach the many and various activities that fall in the category of this title. He suggested a critical need to move our teaching styles away from formal modes to non-formal modes of delivery. I suggest an equally critical need in the area of informal education. And, I will propose ways to move us toward the same goal, non-formal activities" (Wheeler, 1988).

The structure presented, which discards the existence of isolated compartments concerning formal, non-formal and informal education, proposing the existence of a sort of "continuity" in the transition among them, which may occur in both directions, reveals more than a mere academic interest, suggesting a strategy of action extremely useful to the implementation of highly innovative educational systems, such as the one to be presented ahead.

Let us get back to the initial issue. As we will see next, the conceptualization of non-formal education, together with the model of transition from formal to non-formal proposed above, allows the advantageous accomplishment of the gradual transition towards the non-formal, so as to care for characteristics and needs of the student and of the society. Which formal factors are to be suppressed and how fast the process will be carried out will depend on each particular case, always taking into account educational, social, economic and cultural aspects intervening into the process.

While formal education is focused on the binomial teacher-system, non-formal education is focused on the binomial student-society. Thus, in one way, as the transition from formal to non-formal takes place, we move from one educational mode which emphasizes **teaching** to another one which emphasizes **learning**. In formal education, the teacher lies at the core of the process. Consequently, great part of the activities performed emphasizes **teaching**, while in non-formal education the educational process is centered on the student, therefore emphasizing **learning**.

It is not hard to notice the many advantages offered by the new conceptualization of non-formal education and by the transition model proposed. First, unlike what usually occurs, a new institution does not have to be created in order to allow a non-formal model to be implemented. It is possible to start from existing formal institutions and gradually suppress formal elements, aiming to meet needs and characteristics of the student and of the society. This process will include current teachers (naturally after a short preparation period), acting within the same physical structure, with the same existing material and financial resources. Therefore, the transition will not require heavy financial investment or any exceptional effort. Second, being gradual and basically intended to the student and to the society, the transition will certainly not stimulate the students and the society to react against the introduction of innovations into the existing system: this would probably happen in case of a sudden jump from formal to non-formal, changing a significant set of precepts and procedures already existing at the school, as usually occurs as non-formal models following the current conceptualization are implemented. Third, rather than one single non-formal system, the gradual changes to be carried out shall lead to many different non-formal systems, yet presenting one common characteristic, once they have all been "built" aiming to meet students' characteristics, their personal and professional needs, as well as the needs established by the society. Therefore, they will be non-formal systems tailored to one particular reality. Fourth, the strategy presented above avoids the competitive atmosphere involving existing institutions and the new non-formal institution to be created, once it simply will not be created, according to the transition model proposed. The formal institution itself will gradually change into an institution shaped according to non-formal characteristics. By the way, it is worthy to remark, quoting Perry (1981), as the "British Open University" was created at the borderline of the formal educational system, remaining as an example of non-formal education: "This decision was received with skepticism, indeed with scorn and ridicule, by virtually the whole of academic establishment, by almost the whole of the national press, and at least by half of the political world" (Perry, 1981). There are people who claim that the "Open University" has managed to survive thanks to the decisive support granted by the Labour Party, the progressive British party. Otherwise, this University would probably have been extinguished. Fifth, the model suggested might allow wider optimization of the institution's facilities, attending a larger number of students with the same existing human, material and financial resources. And at last, sixth, the strategy proposed allows significant improvement of the results achieved, once the new systems are specifically intended to the student and to the society.

## THE NEW STRATEGY APPLIED TO THE CLASSROOM

The analysis presented, suggesting a certain continuity in the transition from formal to non-formal systems, leads  to the proposal of a strategy where formal factors are gradually suppressed from the initially formal model, aiming to meet characteristics and needs of the student and of the society. For this purpose, one may start from the existing formal institutions, with their very same structure regarding facilities and personnel, gradually promoting the transition required. This is a defendable strategy both politically and technically, allowing a gradual and nontraumatic transition. A series of arrangements must be carried out, including the creation of a working team in charge of granting consultant advice for both the institution and the teachers, regarding the necessary technical and management restructuring.

At the initial stage, the strategy formulated might be applied to the traditional classroom, aiming to reduce its formal character, by means of the adequate suppression of some formal factors. The factors to be suppressed and the changes to be introduced shall be guided by the student's profile, regarding knowledge, aptitudes, motivation level, etc., as well as to his/her personal and professional needs.

We are presenting next some examples where the strategy proposed is applied to traditional classrooms which use the formal model. Let's initially consider the changes to be carried out in order to meet the aspects regarding students' learning procedures. Learning theories remark the importance of respecting the student's individual learning rhythm. If this is to be taken into account, expositive lectures should necessarily be replaced by activities where individual rhythm would not significantly intervene, such as text readings, either individually or in groups, practical activities, group work, involving discussions, problems resolution, etc. Thus, by suppressing the expositive methodology, one of the student's learning characteristics would now be respected. Once some of these activities are basically individual, and can be developed out of the classroom, the "presential" character will no more be required in certain parts of the educational process. Thus, two basic characteristics of formal education – the "presential" character and the expositive methodology – will be suppressed from the initial system, which will then assume non-formal characteristics. Such suppressions will enable the educational process to undergo a significant improvement, granting the student wider participation, with stronger motivation and interest.

Let's suppose now that in this system, which presents non-formal characteristics, one more formal factor is suppressed, so as to meet the need of adequately using feedback during the process. It is widely known that learning theories remark the importance of using assessment results on students' performance in order to improve and control the process, rather than for management purposes. In order to meet this requirement, tests and examinations, which are usually carried out either monthly or by the end of the course, should be replaced for more frequent assessments, based on both individual and group works, and the results should be used as a means of controlling the process, once in case of unsatisfactory results the student shall repeat the same activities, until he/she is able to prove to have mastered the knowledge and the aptitudes required. The suppression of traditional procedures associated to students' assessment will allow the system to assume new characteristics even less formal than the former ones.

In both cases, the changes promoted aim to meet students' learning characteristics. Nevertheless, they may also introduce changes according to the requirements of the student and of the society. Thus, for instance, the traditionally rigid and, in most cases, unrealistic programmatic contents of the course become more flexible by suppressing certain items and by attaching themes of more immediate interest, leaving apart, when suitable, the obligation of fully accomplishing that

programme. The emphasis will move from accomplishing the programme towards learning itself, and the content will be reformulated based on needs which shall be pointed out by the society through its representative organisms. These changes will obviously push the system farther apart from the original formal system, assuming thus even more outstanding non-formal characteristics. The farther it moves towards non-formal education, the best it will meet both student's and society's needs.

Let us now analyze by which means the suppression of a formal factor can meet students' expectation regarding some personal needs. That would be the situation, for instance, of students spending too much time to reach a distant institution. In some cases, this time can be even longer than the period they remain at the institution. Obviously, the "presential" character is thus a characteristic which should be reconsidered. One possible solution would be to release the student from the obligation of going to the institution so often, doing part of the activities at home, for instance, using texts and education materials worked out for self-instruction (using high technology, developed by an interdisciplinary team involving experts on that specific matter, educational technologists, an editorial staff, art and layout personnel, etc.), or even by using conventional books, together with activities and reading sheets, when possible. In this case, as he/she comes to the institution, and under teachers' direction, the student and his/her colleagues will take part in different activities involving debates, explanations, suplementary activities, etc.

These are some examples of the implementation of the strategy proposed in order to promote the transition from conventional classrooms to non-formal systems. As remarked, moving away from an originally formal structure, using the very same personnel and the existing resources, both material and financial, in order to promote the gradual transition towards non-formal model, so as to meet the characteristics and needs of the student and of the society, presents a number of advantages, specially that of allowing the transition to be carried out according to the educational, social and cultural reality of that specific situation, without creating a competitive atmosphere among institutions, but following a cooperative model.


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