THE MEANINGNESS OF KNOWLEDGE OF EDUCATION: FOUNDATIONS IN PEDAGOGICAL KNOWLEDGE AND ITS CAPACITY FOR SOLVING PROBLEMS (AN APPROACH TO THE STATE OF ART FROM THE SPANISH PROFESSIONAL AND EPISTEMOLOGICAL DEBATE)

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SUMMARY[1]

Education is a real area that people may know in different ways, forms and kinds. Several types of knowledge and rationality are useful for making knowledge of education. Philosophical theories, Practical theories, Applied research, have let them built it. To a higher extent, knowledge of education has already made particular and specific concepts.

Along the historical events, knowledge of education has grown in order to achieve a better understanding of facts and decision making. Actually this knowledge is a specialised and specific one. Discussion whether education is a discipline, as Physics or History, has not closed yet.

This study establishes differences between knowledge of education and knowledge of disciplines which are used in the teaching process. Besides this, it emphasizes and upholds the Educational Knowledge Growth Model.

The second half of this work continues to explain the different possibilities that each type of knowledge of education has in order to solve the problems which arise in the intervention: educative, educational or pedagogical one.

All this has been made by focusing the discussion about the theory- practice connection in three different pedagogical mentalities (Weltanschaaung or backgrounds): marginal, subalternated and autonomous. The meaningness of knowledge of education and, on the other side, logical rigor (pertinence), with singnificativity (relevance) in knowledge of education, are topics in the Spanish professional and epistemological debate about the growth of knowledge of education and its capacity for solving problems.

This article is trying to sistematize the Spanish controversy and the special foundations in each current, because such topics have, really, consequences for pedagogical functions, pedagogical intervention and pedagogical discourse.

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1. DIVERSITY OF PARADIGMS AND HOMOGENEITY OF CRITERIA

In 1982 Peters and Ceci made known the results of their investigation about the reliability of the criteria used by editors of scientific magazines to select publishable investigations. Their work consisted of analysing the answers that they had obtained from 12 reputable Psychology magazines. They had sent investigations to be published on those same magazines which were recently already published by them. Those articles had their title and summary modified in an unsubstantial way. In this investigation (Peters and Ceci, 1982), surprisingly, it was found out that nine of the twelve manuscripts were not detected by the editor or by the revision group as the ones previously published in the respective magazine. Out of the nine undetected, which were predictable published, eight were refused due to serious problems of methodology. Peters and Ceci concluded their investigation, by claiming the absence of homogeneous criterion for the correction and the scarce stability of criterion existing in the referees.

In 1987, W. K. Davis carried out a theoretical study about the weakness of paradigms in pedagogical research. He concluded that, although it is true that we are able to establish a sophisticated level in terms of methodology and evaluative techniques, it is also true that a lot of the questions of investigation respond more frequently to opportunist incidents with reference to the field than to a systematic and permanent questioning of the way of facing the sense and goal of the pedagogical intervention (Davis, 1987).

The absence of unification of paradigms in pedagogical investigation has been reported in very diverse works and the international manuals of pedagogical investigation leave evidence of this idea (Wittrodk, 1986; Keeves, 1988). For Schulman (1986) the absence of a singular paradigm of investigation is neither a pathological sign of the field, nor a sign of danger for the field of study. The problem, as Husen says (1988), should be seen, rather, in the dogmatic and reductionist positions which limit knowledge of education to the capacity of solving problems settled down from a certain conception, as it would be equal to denying the possibility of advancing in the conceptual system of a field.

The diversity of criterion, and also the polemic within the investigation, must not be interpreted in a uncontexted way. Controversy and polemic are not synonyms of the absence of results. From the context of pedagogical investigation we cannot forget that, in any case, this one is a polemic of experts about specialised knowledge. At bottom, with this polemic, it is not only revealed the importance of the topic of "education as an object of knowledge" in pedagogical investigation, but rather, it is strengthened the relationship between the pedagogical function and knowledge of education. As Berliner says (1986), the expert educator is the subject of investigation, because he is who is using knowledge of education in an effective way in his intervention, and this is, definitely, what is intended from knowledge of education: it to be adequate in order to explain, interpret and decide the pedagogical intervention.

In our opinion the polemic is not to the discredit of the topic we are studying, because it is possible to establish parameters about knowledge of education that offer some intersubjetivable guidelines of analysis for the different existing positions maintained about knowledge of education. In this way, the question is not the polemic or the diversity of paradigms, but more precisely the possibility of unification of the criteria for the analysis; that is to say, the problem is not the diversity of paradigms, but the

homogeneity of criteria with reference to the identity and evolution of knowledge of education.

2. KNOWLEDGE OF EDUCATION

The level of the current pedagogical investigations allow us to say that there are enough reasons to distinguish and not to confuse in the technical language:

- Knowledge of education, and
- Knowledge of cultural areas.

It is true that, from an anthropological point of view, education is culture and, therefore, it makes sense to affirm that the function of the professional of education is to transmit culture. But, if we also affirm that the educational terms have no own content, knowledge of the diverse cultural areas is converted into the axis of all pedagogical activity to the point that the same professionals of education accept that their training is simply knowledge of those cultural areas.

A detailed analysis of the pedagogical context gives cause for maintaining knowledge of cultural areas and is not knowledge of education, because:

a) Although it is true that a great part of the aims of education have something to do with the contents of cultural areas, the scope of the objectives is not drained in the fields of cultural areas. The pedagogical function, referred to teaching, is not drained in knowing which level of cultural information is being obtained when developing a topic of a cultural area in a class; however, the pedagogical function becomes apparent when it is known which types of skills, habits, attitudes, etc., from the diverse domains the taxonomies mark are being promoted upon working in a special way on that topic. The matter is not knowing so much History as the historian, but which aims of knowledge are achieved and how they are achieved when teaching a topic of History and which skills, habits, attitudes, etc. we are developing when teaching that topic.

b) The identification of knowledge of the cultural areas with knowledge of education promotes an unsustainable pedagogical situation: the tendency to evaluate the scholastic efficiency fundamentally for the levels of cultural information. Without meaning that the content is merely formal and serves to reach any kind of skill, it is possible to assess that, although not with the same level of efficiency to form a pedagogical point of view, with just one of the cultural topics of the curriculum that a secondary level student has got to study, for example, pedagogical strategies leading to the achievement of almost all the educational objectives of the curriculum could be started, except for cultural information.

c) Even if knowledge of education and knowledge of cultural areas are identified, one could understand that there is a determined knowledge of education, speaking in the field of teaching which is not the knowledge of cultural areas: knowledge of the transmission of that knowledge about those cultural areas. The duty of education would be indeed, for example, the transmission of the historic knowledge. In this case, this historic knowledge

would be reliable and valid as a problem for historians; knowledge of education would be, more precisely, the knowledge of the strategies for the intervention.

The theoretical, technological and practical knowledge that comes into objectives of knowledge for teaching are not created by the professional of education. They are the investigators of each cultural area who create them. It is to the professional of the education to whom it corresponds with foundation of technical election deciding whether the student is able to learn them; whether they are coherent with the conceptual representation of the intervention; whether they have a theoretical, technological and practical basis, according to the case; which is the adequate method for teaching and which skills, habits and attitudes can be developed by teaching that knowledge. That is to say, a professional of education masters the theoretical, technological and practical knowledge of the cultural area he is going to teach; but, as a professional of education, he masters knowledge of education which allows him to justify and explain the conversion of that knowledge from a cultural area into objective or instrument for the pedagogical intervention.

Knowledge of education qualifies the professional of teaching, for example, not only for establishing the educational value of a cultural content and participating in the process of deciding its conversion in aim or goal for a certain educational level, but also for establishing programs or intervention adjusted to facts and pedagogical decisions that give effect to the proposed goal.

Speaking about knowledge of education does not mean, therefore, wondering directly about knowledge of the cultural areas. When we are speaking about 'knowledge of education', it is more adequate to wonder about which certain knowledge become a goal or instrument for the educational action or why the cognitive dimension of individuals can be educate. And as well a historian, a geographer, a mathematician, a physicist, etc., could speak to us, depending on the case and with property about knowledge of each cultural area, as they are specialists in each one of those areas of knowledge, we have no doubt when answering correctly if this, which and other historical, mathematical, physical, etc. content must become the content of the educational action we are carrying out with a certain individual or to cultivate its critical sense, requires wondering about education as a knowledge subject. In the first instance, knowledge or cultural areas -- History, Mathematics, Physics, etc. -- are the scientific subject of study; in both cases of the second instance, the same transmission, the exerted influence, is converted into a specific subject for scientific reflection.

According to the reasoning previously carried out, speaking about 'knowledge of education' is the same as wondering about education as a subject of knowledge, what is equivalent to formulating a double question:

- What is there to be known in order to understand and command the field of education; or what is the same, which are the components of the educational phenomenon that one must master to understand the said phenomenon.

- How is that field known; or said in other words, which pledges of truth has the knowledge we are able to obtain about the field of education.

We think it is necessary to tell knowledge of cultural areas from knowledge of education because, up to the same point that knowledge of education goes further than what is transmitted, the pedagogic function in the field of the education begins to be a subject of specialised and specific knowledge.

If we do not tell knowledge of cultural areas from knowledge of education, it follows that, for example, professional competition of teachers would be erroneously determined by the better or worse master of the cultural area which they are going to teach. This type of theory generates terrible aftermaths for these professionals:

- First of all, as knowledge of cultural areas taught would not be created by teachers, they would perceive themselves as learners of knowledge of those areas investigated by other people.

- Secondly, as professional competition would be determined by the master of the cultural area, the mistake of believing who knows more is who teaches the best.

If we do not confuse knowledge of the cultural areas with knowledge of education, it is neither true that the teacher is a learner of the cultural areas he teaches, nor is it necessary true that the more History he knows the better he teaches it, and it is also neither true that the one who better masters a skill is the one who better teaches to another one how to master it, unless, tautologically, we say the skill he masters is the teaching.

This is so because each one of those activities requires different abilities and skills for their master and practice and perfection in one of them does not involve automatically the master of the other one.

In logical rigor, we must accept that knowledge of education is, then, a specialised knowledge which lets the specialist explain, interpret and decide the pedagogic intervention characteristic of the function which it is enabled for, either it is an educational function, or it is for assisting the educational system, or it is a research function.

If we review the previous statements, it seems obvious that pedagogic function, for its meaning principle, demands a specialised knowledge about education.

Of course, it is obvious that pedagogical function is not reduced to education; the professional group of educators is only a part of professionals of education. But the distinction made between knowledge of cultural areas and knowledge of education allows us to distinguish and identify professionals of education and pedagogic functions:

a) Sociologists, doctors, psychologists and other professionals, who properly receive the denomination of professionals of the educational system, as they exercise their profession in and on the educational system, work in the educational system. But a group of professionals of the educational system, who properly deserve the denomination of professionals of education also exists; their work is participating, carrying out the pedagogic functions they have been trained for; the proper content of the formative nucleus in their profession is knowledge of education. *Professionals of the educational*

system and *Professionals of education* are two different expressions with a different meaning; it makes sense to affirm that, not all of the professionals of the educational system are professionals of education, as the only content of their professional training is always knowledge of education. A professional of education is the specialist who controls the theoretic, technological and practical knowledge of education which allows him to explain, interpret and decide the pedagogic participation which characterises the function he is trained for.

b) If we take as a reference tasks and activities to be carried out in the educational field, knowledge of education and the development of the educational system let us identify three types of pedagogical functions, generically:

- Teaching functions or didactic functions, basically identified with the exercise and master of skills, habits, attitudes and knowledge which qualify for teaching in a certain level of the educational system.

- Functions for assisting the educational system. They are functions which do not deal directly with education, although they improve the possibilities of it, because their task is solving pedagogic problems of the educational system which appear with the increase of it and the one of knowledge of education, and that, unless they were solved, they would stop the teaching or make difficult the social achievement of a quality education through the educational system, as for example the school organisation, the social- pedagogic intervention, the educational planning, etc.

- Pedagogic research functions, identified with the exercise and mastery of skills, habits, attitudes and knowledge which qualify for the validation and development of explanation, interpretation and transformation models of pedagogical interventions and educational events.

On the other hand, the distinction between knowledge of cultural areas and knowledge of education, places us also in a special position to establish the distinction between extrinsic goals of education (educational goals) and intrinsic goals of education (pedagogical goals). It makes sense to establish this distinction within the social system and for the subsystem education because intrinsic goals are a characteristic of the subsystem, as they are derived from the same knowledge about the subsystem education (knowledge of education) and, at the same time, extrinsic goals are characteristic of the subsystem, but because they are incorporated to it after being selected (goal = selected value) for the subsystem by being compatible with it, although they have not their origin on knowledge of education.

At this point, we can say theoretic, technological and practical knowledge (about Literature, History, Philosophy, experience of life, Moral, habits, etc.) from the diverse cultural areas constituted in subject of knowledge for teaching are not created by the professionals of education with their specialised knowledge (knowledge of education); it is the specialists of each one of those areas that create them and they become social and

ethically legitimated goals in that society. Precisely that is why, they are candidates for becoming a goal of education. If besides being social and ethically legitimated, they are chosen, they become, not candidates for educational goal, but effective extrinsic goals.

Intrinsic goals, for their part, are those which decide in the system and their content is knowledge of education. Validity of their statements neither merely comes from their social and morally desirable character, nor from their validity in a cultural area, but from the specific tests about the field, which is to say, starting from the meaning attributed to the statements from the conceptual system elaborated with knowledge of education.

This same discourse demands, with coherence, recognising that there is a certain kind of goals (extrinsic goals) which have a historic and variable character subjected to the own evolution of what is socially desirable and to the growth of the determined cultural area it belongs to (today neither mathematics from some years ago are taught, nor are they the same worth in students record; today we are not taught the same habits as some years ago, etc.). We are speaking about knowledge of subjects which take part in education

There are also some other goals, which have a historic and variable character subjected to the own evolution of knowledge of education. We are speaking about knowledge of education derived from education as a subject of knowledge.

Both types of goals are subjected to the historic character. But the answer is very different- due to the type of discourse it is justified by- when we say that men should know some History in order to be educated (extrinsic goal) and some critical sense has to be developed, as without it, men could not be educated (intrinsic goal). In the first case the human being will be more or less educated; in the second one, the individual will be able to be educated or not (logical necessity). It seems, therefore, that a good separation between intrinsic and extrinsic goals is derived from the distinction between logical necessity for something and psychological necessities for the social-historic level in which something is found (who is the educated individual from each period?).

If our discourse is right, as we were saying at the beginning of this section, it is possible to speak and distinguish knowledge of cultural areas from knowledge of education. But even more, as it has been reasoned along this section, it is important to distinguish between education as a subject of knowledge (knowledge of education) from knowledge as a subject of education (the educability of our knowledge), if we may use this expression.

It is clear for us that:

- Speaking about knowledge of education is the same as speaking about the group of theoretical, technological and practical knowledge that the research has been consolidating about the real field which is education. They are themselves knowledge of a cultural area. But, in this case, they are the specific cultural area; the one of education, which becomes by itself a subject of knowledge (education as a subject of knowledge).

- Speaking about knowledge of the cultural areas is speaking about the theoretical, technological and practical knowledge which the

specialists of each area- mathematicians, physicians, psychologists, doctors, etc.- they have been consolidating with their investigations.

- Speaking about knowledge as subject of education is speaking about a certain piece of knowledge of education, the one which allows us to participate to improve our way of knowing.

3. MODELS OF EVOLUTION OF KNOWLEDGE OF EDUCATION

The objective, when analysing the growth of knowledge of education, is to establish an outline of interpretation which permits us, with a logical criterion, to understand the different consideration knowledge of education has or has had. It is intended to describe the proprieties which allow to characterise several moments of the consideration of education as a subject of knowledge. The objective is not the productivity for each one of those moments; what matters, is not the quantity of investigations carried out, but, rather, getting to know how the education as a subject of knowledge is considered in different investigations. It is more interesting the analysis of the hypothesis which allows one to understand education as a subject of knowledge in such a way and not in another one, than the productivity of the said hypothesis, that is to say, that concepts and terminological precessions that are successively stated, once the hypothesis has been accepted. What is especially interesting is to understand the own transformation of education as a subject of knowledge and its progressive adaptation to the field it is studying. It is interesting, in short, to know which are the properties which characterise in diverse moments education as a subject of knowledge and how it is justified that is the investigation which must be done about the subject of knowledge 'education'.

This type of questions is ordinarily collected under the generic denomination of *paradigm of investigation*. The studies of Khun (1978-1979) about this term and the analysis subsequently carried out about the epistemological break (change of hypothesis) which changes of paradigm involved (Bachelard, 1973) are amply well-known in the specialised literature. Despite the fact that it is a semantic data to consider that in Khun¥s work about the structure of scientific revolutions, Masterman detected 22 different uses for the term paradigm (Masterman 1970), the paradigms can be understood as settings for interpretation, or ways of thinking about something; they are not theories by themselves, but once the investigator has become involved or assumed a specific one, it can lead him to the development of theories (Gage, 1963).

We have previously dedicated some time to studying education as a subject of knowledge (Touriñán 1987a and b; Rodríguez Martínez 1989). Our basic worry was establishing a setting of interpretation which allows us to understand the different consideration knowledge of education has or has had. The work, from the starting point, maintains the conviction that the pedagogical concern has always existed although it was not scientific, the pedagogical occupation too, although it was not a professionalised one. What it has not always existed is the same consideration for the pedagogical function, because knowledge of education has not always had the same meaningness, this understood as the capacity this knowledge has for solving problems of education. So, the established criteria in order to elaborate the setting for interpretation must permit, according to the type of answer to them, to configure a specific pedagogical mentality and, therefore, a peculiar way of relating theory with practice (Touriñán 1988-89 y 1991).

3.1. Bibliometrical and Linguistic models.

Among the models used in order to analyse the evolution of knowledge of education it would be adequate to emphasise the so-called Bibliometrical and Linguistic models.

Linguistic models try to resolve the evolution of knowledge of education, by classifying diverse conceptions of the former under statements and specific concepts which in diverse moments have been used for knowledge of education.

When this model is put into effect a considerably great effort is done so as to be able to isolate the different positions existing about education as a subject of knowledge. However, we think this is not the most adequate way for confronting the problem of education as a subject of knowledge, in spite of the fact that the terms pedagogy, science of education and sciences of education have a referent meaning to different historic moments in that evolution (Mialaret, 1977; Husen, 1979; Mitter, 1981; V·zquez GÛmez, 1981 1984; Quintana, 1983; TouriÒ·n, 1987a).

The thesis of the linguistic models is plausible, because, if each term attributed in each historic period to knowledge of education was different from each other, the linguistic evolution would explicitly imply the epistemological evolution (now speaking about knowledge of education). But it is not possible to resolve the problem of the evolution of knowledge of education by starting from the classification of the diverse positions according to the statements and specific terms used in different moments, because the hypothesis of the linguistic model would demand, for its application to the evolution of knowledge, that the same terms could be objects of objectively opposite meanings about knowledge of education, neither at the same time, nor in different historic periods. Actually, it is only in that way that the linguistic model could satisfactorily answer the evolution of knowledge of education.

Under the linguistic models knowledge relating to the meaning of statements like Pedagogy is Science or Pedagogy is more than Science or Pedagogy is less than Science is advanced, as these models connect knowledge with experience and the practice, the investigation and the field or the normativity. But linguistic models cannot forget the checked fact the meaning of the terms is not at all causally connected with the physical-symbolic complex of language: neither the meaning is in the words like something physical, nor the language directly represents things.

Thereby, with linguistic models, a source of confusion it is introduced in the evolution of knowledge of education, because:

- Terms and statements do not necessarily imply by themselves evolution of knowledge of education.

- Some terms, attributed to different periods of evolution, are co-implicated for their meaning in the same way of understanding knowledge of education and do not imply, therefore, evolution.

- The same term and statement acquire a different meaning in different moments, and vice versa, different terms can have the same meaning. So,

with reference to the evolution of knowledge of education, the said term and statement could designate objectively opposite positions relating to the way of understanding education as a subject of knowledge.

On the other hand, from the point of view of sociology or the knowledge, bibliometrical investigations are being lavished (Escolano, 1983; Pérez Alonse-Geta, 1985). But, although it is true that these type of studies give information about the evolution of knowledge of education, it is also true that they are data centred in the increase of production, in the productivity of a field; or said in other words, productiveness of a hypothesis, more than in the modification, innovation and change of hypothesis, that strictly speaking, are the changes which determine the evolution of the knowledge of an area.

3.2. Traditional model of Evolution of knowledge of education

In the evolution of knowledge of education, it is traditionally accepted that it is possible to establish three stages, each one with its own reasoning. This classification, known as the traditional model of evolution of knowledge of education, was summarised by G. Avanzini (1977):

a) Stage of Philosophy. In this stage the knowledge legitimated as knowledge of education is strictly philosophic, about goals of life.

b) Stage of the science of education. The knowledge legitimated as knowledge of education is strictly positivist, about means for given goals.

c) Stage of the sciences of education. The field of education is wide and complex enough for diverse sciences to perform their task of study, building interpretative theories and practical ones.

We understand that this model, which has been acknowledged in other works (Tourián 1987a and b) should not be considered as a right categorization of the evolution of knowledge of education because of very different considerations we show in a summarised way now.

The traditional model states that preponderance of a certain conception about education as a subject of knowledge (basic reasoning of this period) and the progressive specialisation of knowledge of education, are the basis for the determination of the three stages and therefore the evolution of knowledge of education.

This position is really possible, as specialisation configures different ways for understanding the subject of knowledge. However, the traditional model does not cover this function of evolution of knowledge of education with precision, as it neither has a logical rigor (pertinence) nor a significativity (relevance).

The traditional model does not have a logical rigor, as, if a stage is defined by the preponderance of a kind of thinking (Philosophy, Science, or Sciences), it makes possible the classification for each concrete work of thought in two different stages. Actually, each

work could be included in the stage in which the way of thinking used in that work prevails, and it can be also included in the corresponding stage to the moment in which the work was written, although the predominant thought in that moment is not the same of the work.

If nowadays we write a work about education with a mentality of stage of Philosophy, it could be classified into that first stage and could be classified into the last stage, because we have written it in the moment of validity of this third stage. This ambiguity reduces the significativity of our hypothetical work, because its relative value in the evolution of knowledge of education is different depending on whether it is included in one or another stage, and, in even in some case, because of the predominant tendency, it could be unnoticed or refused for not being significant due to its opposition to the approach or even to its being outside the approach.

We reject the traditional model, because it uses stages and currents in such a way that a certain work is susceptible for being included in two different stages. But, fundamentally, we refused the traditional model, because between its stage of the science of education and its stage of the sciences it maintains the same general consideration of education as a subject of knowledge: in both cases education is solved in terms of another science. Those two stages do not suppose two currents of different thought about knowledge of education. Both stages agree in the possibility of a scientific subalternated study of education. Both stages deny the possibility of the autonomous scientific study of education. Both stages are different, because, in the stage of the science of education, education is a setting of reference without intrinsic meaning which is solved by using the principles of an only generating discipline; in the stage of the sciences of the education different generating disciplines are admitted. The top of the traditional model is the negation of the scientific autonomous study of education, and consequently, speaking properly, the traditional model is only the model of the subalternated scientific studies of education.

It is acceptable to affirm that philosophy was first, then science and after that, sciences of education. But we should not forget that the preponderance of a certain idea on another is a criterion of social consideration, not an epistemological criterion. If taken as an epistemological criterion, we are affirming that the philosophic thinking would be just about to extinguish; a primitive and with no differences understanding that is being continually emptied by the particular sciences. The reality of the facts does not confirm that. Current studies exist which prove that Philosophy arose from the beginning as a discipline different from the others (Palop, 1981, pp. 46-52); the problems set up by philosophers and scientists are different (Rey, 1959, pp. 37-38; Strong, 1966, pp. 7-8), which means that decreasing the number of people dedicated to philosophic problems, does not alter the logical pertinence of the intellectual worries with which they are concerned.

3.3. Model of Growth of Knowledge of Education

In the topic which we are treating now- the evolution of education as a subject of knowledge-, we must show means for which knowledge of education guarantees its productivity in such a specific way and it is changed in the same measure that complex way of production does not adapt itself totally to the strange reality it tries to know: education.

As well as a living creature regulates and transforms itself in order to adapt to its circumstances, and the knowledge of its growth is the knowledge of that organic dynamism, the way of knowledge of education grows. It is an organisation that, once configured with reference to its subject of knowledge- education-, produces a certain type of answers (knowledge about education). The way of getting answers can be perfected without varying the supposing of knowledge from which we start (simple growth); this is the typical way of growth within each conception and allows one to develop sub-stages of growth. But, also, it can be perfected the way of getting answers by varying the supposing of knowledge which we start from because the subject to know is considered with another level of complexity (growth by innovation); this is the typical way of growth inter-knowledge and it permits us therefore to distinguish them.

In the model of growth there is of current an organicist hypothesis; the one of thinking analogically the development of a systematic field (the education) as an organic growth.

The economy, the organisation and studies about the development of science have applied the model of growth; to the point that all politics of advanced planning in any field is direct or indirectly based on the model of growth (Denison, 1968; O.C.D.E., 1968; Kindelberger, 1965; Schumpeter, 1949; Simon, 1957, 1964; Etzioni, 1964; Churchman, 1961; Bertalanffy, 1976,1979).

The theory and the practice of the reformations of the structures have taken a new sense more concrete under the effect of the analysis of the systems (Morin, 1984; Wilden, 1972; Piaget, 1977; Luhman, 1983).

The model of growth, through its diverse manifestations, has consolidated two types of growth: simple growth or growth by productivity of the assumption and growth by innovation or growth by changing of hypothesis (Touriñán, 1987a y b)

Within the simple growth several methods are included to increase the production of knowledge from the configured organisation, that is to say, without varying the assumed hypothesis we start from, either applying the configured organisation to all the problems of the field we want to know (simple extensive growth) or increasing the production in the diverse looking which can be treated by means of the configured organisation (simple intensive growth). Or reorganising the current systematising the problems to try and/or improving (not substituting) the way of participating in the reality to be known (simple intrinsic growth) (Touriñán 1987a y b; Rodríguez Martínez, 1989).

The improvement in knowledge within the accepted assumption is understood as progress; the change of hypothesis always implies an innovation that affects the basic structure of the knowledge we start from. The change of hypothesis or of paradigm is usually revolutionary, that is why this way of growth in where it is logical to speak about epistemological breach (Bachelard, 1973, 1974; Kuhn, 1979).

Despite what we have just said, we must take into account that change of hypothesis is not produced immediately, but rather it, always supposes a period of confrontation between which under the initial assumption was *normal science* and the new paradigm which is being configurated as the most adequate way in order to deal with the

problems which from the 'normal science' did not find satisfactory explanation or resolution (for example Darwin's theory of the evolution of the species). This means that a part of the knowledge produced by the prevailing supposition until that moment is going to be rejected, another part is going to be explained in a more adjusted way to the new assumption, and another part of it is going to be considered obsolete. Also, investigations with a change of hypothesis are going to be centred in problems which in the previous assumptions did not have a meaning or had a scarce importance. In our concrete case, the growth of the knowledge by innovation implies a change in the consideration of the education as subject of knowledge.

4. CURRENTS ABOUT KNOWLEDGE OF EDUCATION

By analogy with the evolution of other knowledge and on application of the model of growth to knowledge of education we can find, nowadays, three different currents in the evolution of knowledge of education. The three currents of education are denominated, according to the consideration they do about education as a subject of knowledge, as follows (Touriñán, 1987a):

a) Marginal or experiential current.

b) Subalternated current or current of the scientific studies of education and practical theories

c) Autonomous current or current of education with intrinsic meaning in its terms, so that it can be able to generate substantive theories and specific technologies of education.

Each one of these currents is different from the other one according to what the answer to the following questions is:

- The consideration of education as a subject of study.
- The kind of knowledge to be acquired in order to know education.
- The way to solve the act of intervention.
- The possibility or not of getting scientific study and science of education.

Each one of these currents has contributed a non-worthless knowledge about the education. Their achievements are the basis of their strength inside the union of the professionals of education. Each current marks a peak of knowledge, creates a pattern of justification of the pedagogic action and establishes some limits to the capacity for solving problems about knowledge of education. The pedagogical discourse of each current establishes for the participation a different theoretical- practical relationship, which characterises the pedagogic function for the participation. The pedagogical discourse, the pedagogical function and the pedagogical participation are understood in a different way in each current, because the answers to the criteria, configure different pedagogical mentalities, as expressed in the square that follows:

CURRENTS OF KNOWLEDGE OF EDUCATION

DISCRIMINATING CRITERIA	A	B	C
	Education is not a subject of genuine study. It is a practical activity.	The education is a subject of genuine study that is solved in terms of the generating disciplines.	The education is a subject of genuine study that allows one to generate characteristics concepts of the field.
	The essential knowledge is the one of the goals of desirable life.	The essential knowledge is the one of the means for given or practically elaborated goals from education.	The essential knowledge is the one of goals and means logically implicated in the process.
	The intervention is experientially solved.	The intervention is solved by prescription of rules validated with the interpreting theories.	The intervention requires generating rules of pedagogic intervention : establishing links and prescribing lines validated with the substantives' rules.
	The scientific study of education is not possible because it is a practical and singular activity.	Scientific study of the education is possible. There are sciences of the education.	There is Pedagogy as scientific construction with its own concepts.

DIFFERENT PEDAGOGIC MENTALITIES*
THEY GENERATE DIFFERENT CONTENT FOR THE CONCEPTS: - Pedagogical Function. - Pedagogical Intervention. - Pedagogical Discourse.

* To the effects of this discourse, we understand mentality as a synonym for " weltanschaaung", cosmovision, general conception of education. The current is the setting of interpretation of how knowledge of education is . It is the concept known of knowledge of education: marginal, subalternated and autonomous. The pedagogical function is identified with the exercise of tasks whose realisation requires abilities acquired by means of knowledge of education. The Pedagogical Discourse is understood as the ordered group of reasoning with basis on knowledge of education that allows one to explain, interpret and decide the pedagogic intervention characteristic of pedagogical for which one is enabled. At last, the pedagogical intervention is defined as the intentional act in order to carry out goals and means justified, with knowledge of education.

a) The currents operate as paradigms. By themselves they are not theories, but, once the investigator is committed to one of them, the current constitutes the setting of interpretation from which the theories about the pedagogical function, the pedagogical discourse and the pedagogical intervention are constructed. As patterns for interpretation, the currents configure the pedagogical mentality of their supporters and this mentality operates, either as a presupposing of investigation or as the assumption. In the context of the discovery of investigation it operates as a presupposing; the pedagogical mentality is, perhaps, an anticipation of what it is hoped to get, and searching is centred on what has a meaning from a specific way of thinking. In the context of justification of investigation it operates as the supposed; the pedagogic mentality is what is not detailed in investigation and, however, the meaning of what we assess about education depends on it. It is precisely for that reason that each current redefines the field of knowledge of education, creating new ideas or reformulating existing ones.

b) Each current, as a useful means for investigation, demands some logical rigor (pertinence) and significativity (relevance). Logical rigor is defined as existence of some characteristics protected with exclusivity in each current and that, at the same time, determine a different way of understanding education as a subject of knowledge. Logical rigor means, therefore, that the introduction of work into a current is done if and only if the work defends and reproduces the conception of education as a subject of knowledge specified by that current. The important thing, for the inclusion of a piece of work in a current, is not the moment when it is written, but the suitability of its conception about knowledge of education to the one specified for the current. On the other hand, the significativity (relevance) is a consequence of the logical rigor, and means that, besides classifying a piece of work or a thought within a current, we have to know the value of that thought or of that work in the current. The significativity is defined as the capacity, the representation of knowledge of education has resulting from the model, has of putting in order knowledge of education that has happened in the time. The significativity of the model facilitates the following things (Touriñán 1987c):

- Identifying the conception of knowledge of education in work. The fact of including it in a current demands it to defend a conception of education as a subject of knowledge different from the one that it would defend, if it was included into another current.

- Distinguishing evolution based on the productivity of the assumption (production from a specific conception of education as a subject of knowledge -simple growth-) and the evolution based on a change of hypothesis (elaboration of a different conception of education as a subject of knowledge -growth by innovation-).

- Adjusting to the events actually happened in the development of knowledge of education; which means that the model of growth by itself must not imply disregarding of works about Pedagogy not adjusted to the most important tendency in knowledge of education in a certain period of time.

c) Each current has a peak: its specific answer to the discriminating criteria. That is the reason why, precisely, we say that everything related to the topic of study (the

education) and does not contradict the answer to the criteria, may be included into the current. For this reason the currents are defined, neither by the method, nor by its conception of the science that they defend more frequently, nor by its philosophic conception of life that their supporters have. What defines a current is not its method, because in a current every method suitable for the specified top is possible. Neither is a current defined by the different scientific conception, because, concerning the consideration of education as a subject of knowledge, that conception is something external. Actually, our consideration of education as a subject of knowledge does not vary, because either we defend one or another conception of the science in any case of that diverse scientific definition, we accept that we consider education as a subject of scientific treatment. For the same reason we could say that several conceptions of life are not different conceptions of the education as a subject of knowledge. The goals of the education that must be defended is what varies in each case, according to which the conception of the life is, humanist, personal, catholic, etc., but all these conceptions are acceptable in the same pedagogic conception: we could conceive the pedagogical function as a simple experiential practice, although the goals to achieve this vary according to the philosophic conception we defend. Consequently, each current has a top determined by the answers to each one of the discriminating criteria and, so what defines the current is the consideration of the education as a subject of knowledge done from the current.

d) By the way of answering the discriminating criteria each current has a different way of understanding knowledge of education. Each way of understanding knowledge of education has generated a group of non-worthless knowledge about education. The three currents are legitimate ways of approaching education. The contributions of each current are the basis of its force within the guild of the professionals of education. According to the pedagogical mentality configured, the substantivity of the pedagogical discourse , the intervention and the pedagogical function are settled down. In this sense, criticising a current is not a synonym for absolute abandonment of what was considered valuable, as knowledge of education, by the criticised current. The topic is, rather, recognising that when redefining the setting of interpretation, new values are created or the ones existing are formulated again. The problem set up obliges to distinguish, in accordance to the top of each current, the fecundity of a hypothesis(in this case, current), on one hand, and the ways of investigation that are paralysed or hinder the hypothesis, on the other. The critics is not the fecundity, but the same assumption of each way of considering knowledge of education. The basic question is not the productivity, but the adequation of limiting the meaningness of knowledge of education to the capacity for solving problems that are attributed to knowledge of education in each current.

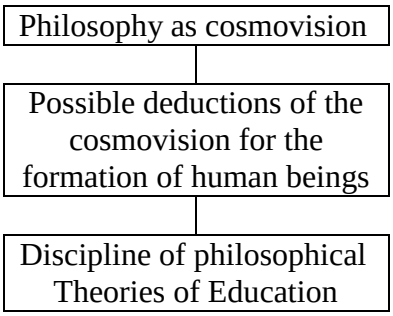
5. KNOWLEDGE OF EDUCATION AND PEDAGOGICAL KNOWLEDGE

After these steps, it seems evident that wondering about what knowledge of education is needed, claims a wide answer that does not remain restricted to knowledge of education that one of the currents gives. According to the type of problems we are setting up, we will need autonomous, subalternated or marginal knowledge. Sometimes we will need science of education (for rules and norms derived from the process); we sometimes will need scientific studies of education, practical theories and theories for interpretation (rules for given goals and orientations of the action to certain consequences justified by the interpretative theory); finally, we will need philosophic studies of education, when we

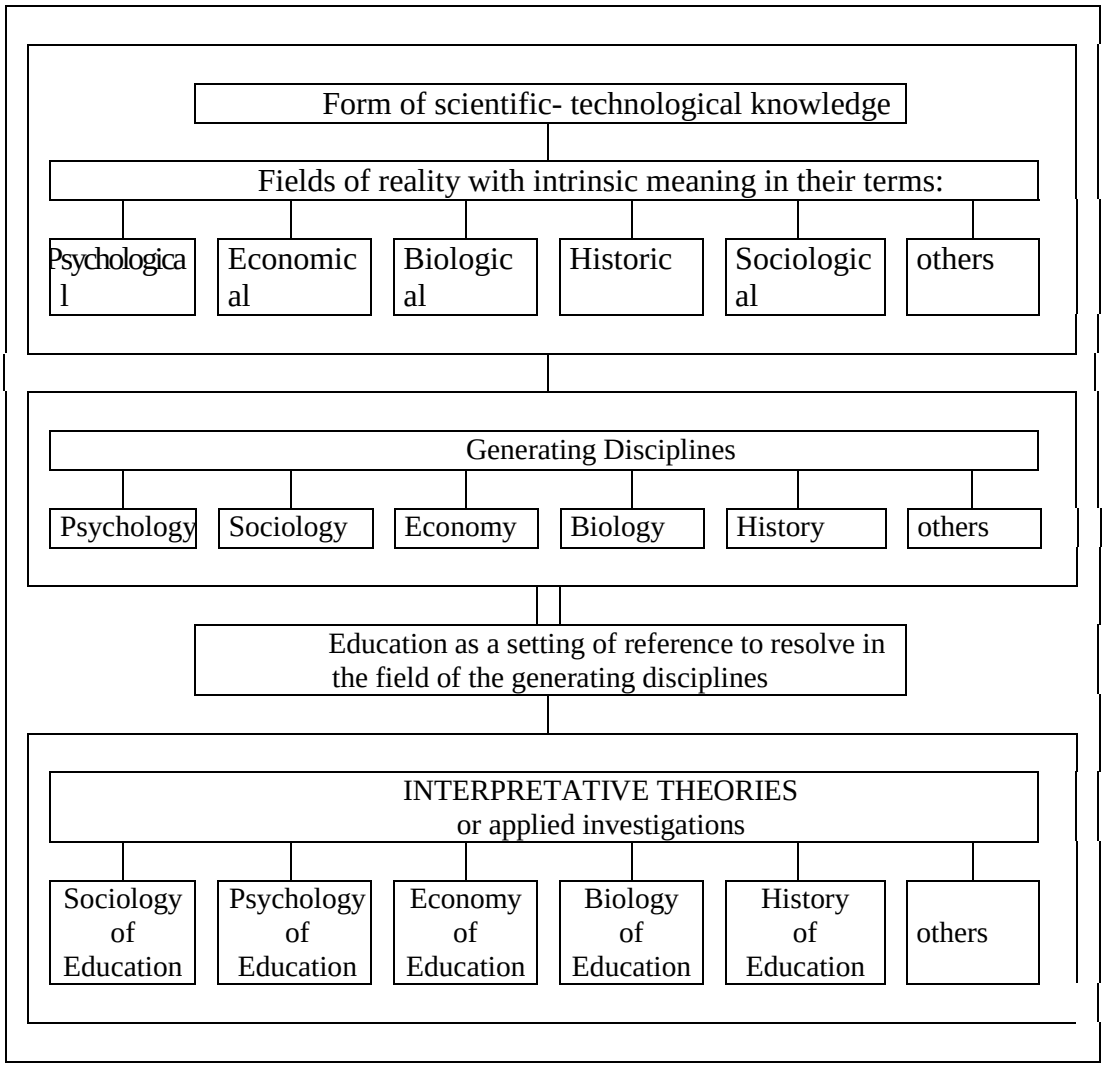
want to make phenomenology about a goal by itself, to study the internal logic of the goal within the conceptual system of Education or to know the consequences that are derived for education from a certain conception of life.

Knowledge of education comes from very different forms of knowledge (see Touriñán 1987a, 1987b, 1989) and it generates very diverse disciplines. There are some disciplines derived from the Philosophy, from the interpretative theories, from the practical theories and from the substantive theories. The conceptual structure of knowledge of education in each one of them is different.

The conceptual structure of the philosophic theories of the education is deductive, from the conceptions of the world and of life:



The conceptual structure of the interpretative theories adjusts to the following chart:



The interpretative theories establish links between conditions and effects of an educational event in terms of generating disciplines, as in the interpretative theories the education does have neither, an own conceptual system nor an own consolidated structure. To the effects of this discourse we consider synonyms applied investigation and interpretative theory. In scientific literature, the term 'applied' has two meanings:

- As an application of a science to another knowledge (this is the strict sense of the interpretative theory).

- As an application of a science to practical problems or to social objectives (it is the strict sense of the practical theories).

Both sides of applied investigation have been opposite to the concept of technological investigation, giving place to three categories: basic investigation, applied investigation and technological investigation.

In our opinion the former sense (a) of applied investigation is epistemologically similar to the structure of the basic investigation (patterns of explanation, linked by means of theories both conditions and consequences).

The second (b) of applied investigation has epistemologically, a similar structure to the one of the technological investigation (it transforms a reality by linking means of the theories, a process of regulation that allow the achievement of the goals by constructing the most adequate conditions).

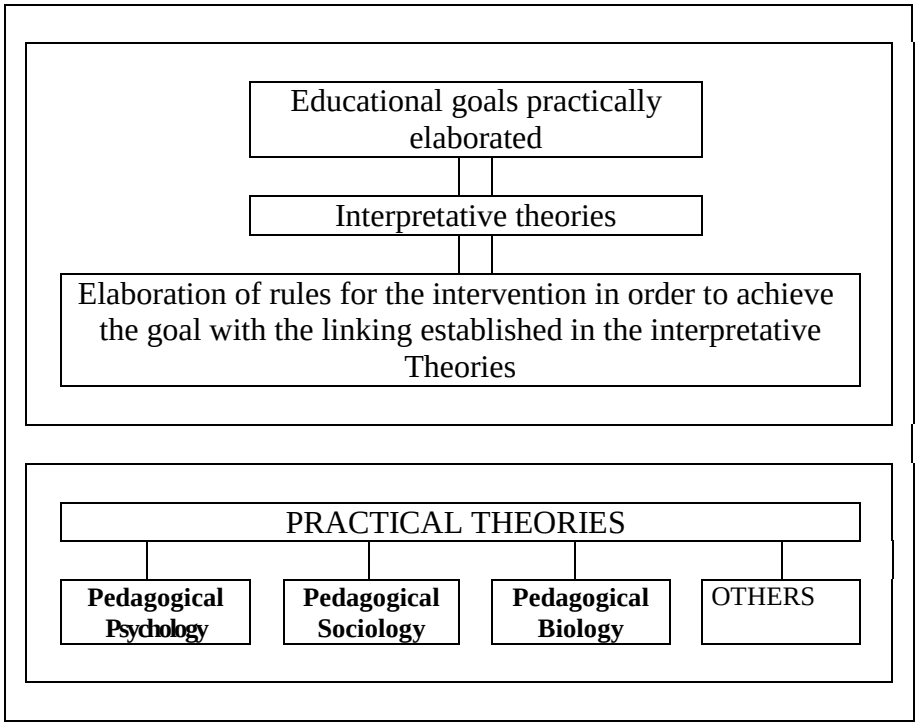
Our position, therefore, distinguishes two great epistemological categories: scientific investigation and technological investigation. Each one of them is susceptible, at the same time of two structures:

- Scientific Investigation (basic and applied or interpretative theories).
- Technological Investigation (practical theories and substantive technologies).

Both categories have a specific role in their practice, which is understood here as the application of the steps of concrete intervention in each case.

However, it must be clear that the greater epistemological similarity related to the structure, between the practical theory and the technological investigation, opposite to the interpretative theory, does not allow one to forget the differences between practical theories and substantive technologies. The practical theories as the validity of the goals is not derived from the process but from the social and ethical characters of them, it is suitable as well, to set them with a basis on the practical rationality. The practical theories are included, because of the validation of the means, in scientific-technological rationality, and because of the checking of the goals in the practical rationality.

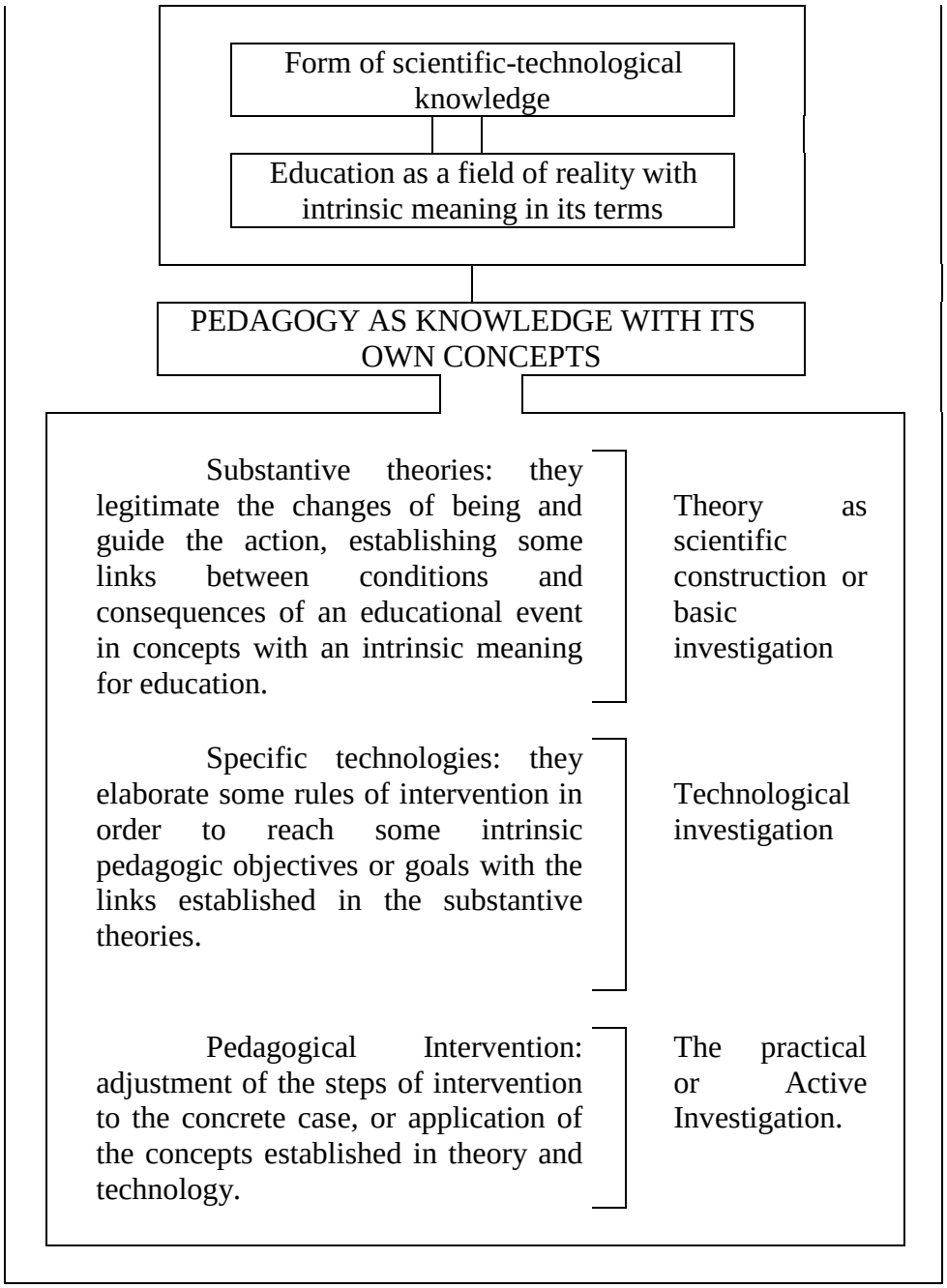
The conceptual basic structure of a practical theory, which we are reproducing next, responds to a conception by means of which Practical Theories are defined as rational constructions that guide the actions combining goals socially and morally sanctioned as educational goals and means validated by interpretative theories. The practical theories are not only a question of education, but of any other field in which social expectations exist. In education, social expectations exist and it seems impossible to deny, therefore, that it is an adequate field for the development of practical theories,



In order to clarify this conception of the practical theory, it is opportune to follow a compared strategy. Actually, biology is a scientific discipline with a consolidated theoretical structure. It has both substantive theories and specified technologies, elaborated in characteristics concepts of Biology from some concepts of biology, its substantive theories establish links between conditions and effects, and that they legitimate some changes of state, that is to say, they establish intrinsic goals or objectives of biology; on the other hand, their specific technologies prescribe rules in order to reach those intrinsic objectives with the links determined in its substantive theories. But , also, if we wonder how to contribute to the health of society with biology, we are setting up a question of practical theory. Biology is an autonomous study that has its intrinsic objectives; but, it also contributes to solve extrinsic objectives from practical theories as well as the former it can be interpreted in biological terms. With regard to education we can act similarly and understand it as a social goal which is solved in terms of biology; we are constructing so, in the first place, the Biology of the education as an interpretative theory and, after we are generating the pedagogical biology or practical theory of education from the pattern subalternated for Biology.

The basic conceptual structure of a substantive theory is adjusted to the structure on the following Chart.

From this way of thinking it is legitimate to say that Pedagogy in this sense is both theory and technology of Education, that is to say, that besides existing, as we have already seen, some investigations applied to education and practical theories of education, there is some basic and technological investigation in Pedagogy (Castillejo and Colom, 1987; Touriñán, 1987 and 1993).



Pedagogy in this sense and interdisciplinary studies of education, or studies subalternated, or the philosophic studies of the education are not confused, although they all are knowledge of education and they all take part in a different measurement in the studies of Pedagogy as University studies.

The same as we can assess that not all knowledge of education is Pedagogy in the previously exposed way, we can also affirm, without contradiction, that from every knowledge of education there derives a certain pedagogical knowledge, because the pedagogical knowledge emerges from the study of the intervention, that is to say, from the study or the theory-practice relationship; and, in each current, for its way of understanding knowledge of education, a knowledge that is different from the intervention is generated

(in some cases the knowledge is experiential, in some other cases it is of practical theory and in others of specific technology).

Knowledge of education has its most genuine manifestation in the pedagogical knowledge, which is the one that determines the professional action for each pedagogic function . The pedagogical knowledge is generated from the study of the intervention, and provided that from all knowledge of education a certain consideration or recommendation for the intervention is derived through the theory-practice relationship, we can say from all knowledge of education a certain pedagogical knowledge is derived. We can say for the same reason that every educational intervention is, in a certain way , a pedagogic intervention because in every educational intervention there is a component of pedagogical knowledge, which is born from the study of the theory-practice relationship which does not always have the same level of technical elaboration in its awakening. This is true and we can say, therefore, that in a certain type of educational intervention there is an experiential pedagogical knowledge, in one, there is some pedagogical knowledge of a practical theory and, in another, there is some pedagogical knowledge of some specific technology.

DERIVATION OF THE PEDAGOGICAL KNOWLEDGE

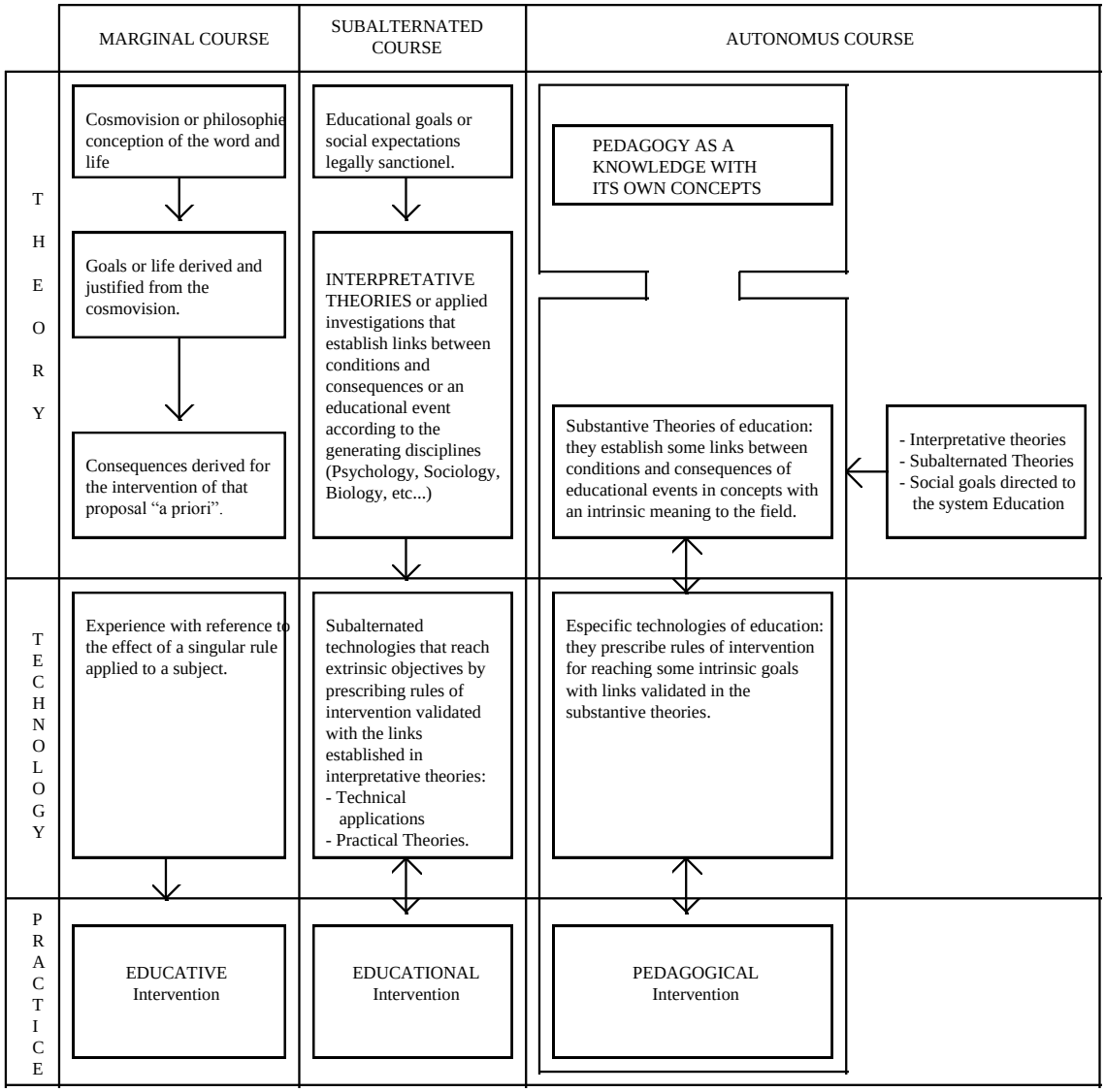
		MARGINAL COURSE (Philosophic studies) Cosmovisionary	SUBALTERNATED COURSE (Scientific and philosophic-interpretative studies)	AUTONOMUS COURSE Knowlege with intrinsic meaning to Education
DISCRIMINATING CRITERIA	Kind of knowledge to be achieved in order to know education	Goals of life and justification of goals. Aftermath deducted for education. "Philosophie-cosmovisionary Theories"	Means for given goals. Theories which link conditions and consequences to an event. "Interpretative Theories. Applied investigation"	Goals and means derived from the process. "Substantive Theories"
	The way to solve the act of intervention	Experiential	Practical theory	Specific technology
	From where the component of pedagogical knowledge comes in each intervention	From the capacity of resolution of problems for the intervention with the theory-practice relationship in the Marginal course.	From the capacity of resolution of problems for the intervention with the theory-practice relationship in the subalternated course	From the capacity of resolution of problems for the intervention in the theory-practice relationship in the autonomus course.

6. PEDAGOGICAL INTERVENTION AND MEANINGNESS OF KNOWLEDGE OF EDUCATION FOR EACH CURRENT

The meaningness, which is not to be confused with the significativity that we have already identified in sections III and IV, is defined as the capacity of solving problems that is attributed to knowledge of education in each current (Touriñán 1987b).

Each pedagogical mentality generates, as we have already said, a different content for the discourse, the function and the intervention ,which is collected, with reference to the theory-practice relationship, in the Chart of Solving Problems for the intervention which we are exposing and commenting next, by explaining the basic structure of each (see Touriñán, 1987b, 1989).

SOLVING PROBLEMS FOR INTERVENTION



In the marginal pedagogical mentality, the capacity of solving problems of intervention attributed to knowledge of education is limited to the personal experience somebody has of its action and to the consequences that are derived for education from the cosmovision that is assumed. From a global perspective, we think it is absolutely correct to accept, that under the intervention of any technician underlies a generic idea of individuals. At bottom, the studies that belong to the marginal current provide some knowledge about the consequences that would be derived from each cosmovision that is postulated as 'a priori' of the intervention. But its capacity in order to generate pedagogic intervention is scarce because the relationship between theory and practice is external in this current. This proposal for an external connection between theory and practice is valid for the philosophic theory, but insufficient in order to resolve the pedagogical intervention. The theory gives desirable goals for life and general recommendations for the behaviour; at the same time, the practice will be carried out in the same way as it is known that the objective is to achieve the one that is a certain desirable goal for life. In a mentality like that practice is independent from theory, with reference to justification of the action, because the function of theory is not explaining the way of intervening, but identifying the goal. At most we can get is that an external link between theory (goals to reach) and practice is produced. Practice merges with theory, when the former is successful, that is to say, it is some good practice, because it allows reaching the goal. But it is not said: it is good practice, because the theory explains what must be done.

In the subalternated pedagogical mentality, the capacity of solving the intervening problems attributed to knowledge of education is corresponding to the practical Theories elaborated in a subalternated way with the interpretative Theories and the goals socially sanctioned as goals of education. For this mentality the connection between theory and practice is not external as in the marginal currents. The theories explain and interpret some links existing between conditions and consequences which affect the educational knowledge in terms of the generating disciplines. The practice is the application of certain steps for intervention. Between theory and practice we find technology and it is the process of prescription of rules for the intervention in order to reach goals. In this approach practice is not independent from theory in order to justify the action. The interpretative theory, in the context of justification of the action, governs the practice, because the function of the theory is explaining the way of intervening, by establishing links between conditions and consequences which constitute an intervention, once it is assumed that theoretical interpretative context is adequate to the educational goal practically elaborated. But practice does not govern theory in the context of justification of the action, because the validity of the interpretative theory has been settled down in its own field, which is that of the generating disciplines, and that of the educational goal has been practically settled down. The validity of these rules is guaranteed by the validity of the established links in terms of the generating discipline by the proved efficiency of the rule; that is to say, by the measurement in which the established links are useful to reach the educational goals socially and practically elaborated from the education system. In the pedagogical subalternated mentality, if an applied rule is not effective in an intervention, it does not cancel the validity of the links established in the generating discipline, it only questions the application.

In the autonomous pedagogical mentality the capacity of solving the problems of intervention attributed to knowledge of education is one of elaborating some principles and strategies for a pedagogical intervention from the substantive theories of education and specific theories. In the autonomous current, the connection between theory and

practice is not external as in the marginal current. As well as in the current of subalternation, theories explain and establish links between conditions and consequences which affect an event, the practice is the application of certain sequences of intervention, and between the theory and practice we find the technology which is the process of prescription of rules for intervention. However, the fact that the same concepts with an intrinsic meaning to the education, are not only those ones which interpret links between conditions and consequences, but also those which legitimate the pedagogical goals, unlike the current of subalternation it makes practice be interdependent with the theory in the context of justification of the action. The substantive theory governs the practice in the context of the justification of the action, because the function of the theory is to explain the way of intervening, by establishing links between conditions and consequences that affect some intervention. But, at the same time, the practice governs the theory in the context of justification, because it is the facts that happened in each intervention the ones that are used as an element of reference to check how the theory reports correctly events which have happened . The validity of the rule is the validity of the links established in the substantive theories and the proved efficiency of the rule to reach the goal. But as links and goals are settled down in the same way, if a rule applied to an intervention is not effective, the validity of the established link in the substantive theory can be affected. Actually, as the links and goals are settled down in the same terms, if, once the conditions of application of a rule are adjusted in accordance to the technological principle of efficacy, the intervention does not produce the foreseen consequence, one must think the theory is wrong, because it does not report the intervention correctly. In this sense the practice governs the theory and technology is the starting point to change the theory. In this case, starting from the practice, not only it is questioned the applicability of the theory, but also its correction.

7. BIBLIOGRAPHY

AVANZINI, G. (1977): *La Pedagogía del siglo XX*. Narcea, Madrid.

BACHELARD, G. (1973): *Epistemología*. Anagrama, Barcelona.

---------- (1974): *La formación del espíritu científico*. Siglo XXI, Buenos Aires.

BELTH, M. (1971): *La educación como disciplina científica*. El Ateneo, Buenos Aires.

BERLINER, D.C. (1986): "In pursuit of the expert pedagogue". *Educational Researcher, 15*. 5-14.

BERTALANFFY, L. Von (1976): *Teoría General de Sistemas*. Fondo de Cultura Económica, México.

---------- (1979): *Perspectivas en la teoría general de sistemas*. Alianza Universidad, Madrid.

BROUDY, H.S. (1977): "Types of Knowledge and purpose of education". En R.C. Anderson et al.: *Schooling and the adquisition of Knowledge*. 1-17. Laurence Erlbaum Associates, Nueva Jersey.

BUNGE, M. (1981): *La investigación científica. Su estrategia y su filosofía*. (6ª ed.). Ariel, Barcelona.

---------- (1985): *Treatise on basic philosophy*. Vol. 7. Part. II. Reidel, Dordrecht, Holland.

CASTILLEJO, J. L. (1985): "Sugerencias para una teoría de la ciencia pedagógica". En P. Aznar et al. *Conceptos y propuestas (II)*. Teoría de la Educación. 45-56. Nau Llibres, Valencia.

CASTILLEJO J. L. y COLOM, A. J. (1987): *Pedagogía Sistémica*. Narcea, Barcelona.

COLOM, A. J. (1983): "La Teoría de la Educación y la oferta de la Teoría de Sistemas generales". En la Obra Conjunta *Epistemología y Pedagogía*. 108-155. Anaya, Madrid.

---------- (1986): "Pensamiento tecnológico y Teoría de la Educación". En la Obra Conjunta *Tecnología y Educación*. 13-30. CEAC, Barcelona.

COMISION (1986): "Documento de bases para la elaboración del estatuto del profesorado". *Escuela Española* (2.802, de 6 de febrero).

CHURCHMAN, W.C. (1961): *Prediction and optimal decission: philosophical issues of a science of values*. Englewood Cliffs, Nueva Jersey.

DAVIS, W.K. (1987): "Educational research in the professions: Paradigms, peer review and promise". *Professions Education Research Notes. 9* (1), 4-9.

DENISON, E.F. (1968): *The sources of economics growth in the United States and the alternatives before us*. Conmittee for Economic Development, Nueva York

ESCOLANO, A. (1980): "Diversificación de profesiones y actividades educativas". *Revista Española de Pedagogía* (147).

---------- (1983): "La investigación pedagógica en España. Aproximación bibliométrica". En J. Basabe et al.: *Ensayos de epistemología y pedagogía*. Anaya, Madrid.

ETZIONI, A. (1964): *Modern organization*. Englewood Cliffs, Nueva Jersey.

FULLAT, O. (1979): *Filosofías de la Educación*. CEAC, Barcelona.

GAGE, N.L. (1963): *Handbook of research on teaching*. Rand McNally, Chicago.

GARCIA CARRASCO, J. (1980): "Ciencias de la educación y profesiones pedagógicas. Problemas académicos y curriculares". *VII Congreso Nacional de Pedagogía.* Vol. I. S.E.P., Madrid.

---------- (1983): *La ciencia de la educación. Pedagogos ¿para qué?*. Santillana, Madrid.

---------- (Coord.) (1984): *Teoría de la Educación. Diccionario de Ciencias de la Educación*. Anaya, Madrid.

GARCIA GARRIDO, J. L. (1984): *Sistemas educativos de hoy*. Dykinson, Madrid.

GARCIA HOZ, V. (1970): *Principios de Pedagogía Sistemática*. (5ª ed.). Rialp, Madrid.

GIMENO, J. (1982): "La integración de la teoría del aprendizaje en la teoría y práctica de la enseñanza". En A. Pérez Gómez y J. Almaraz: *Lecturas de aprendizaje y enseñanza*. 467-469. Zero, Madrid.

---------- (1982a): "La formación del profesorado en la universidad. Las escuelas universitarias de formación del profesorado de E.G.B". *Revista de Educación. 30* (269).

HIRST, P. H. (1966): "Educational theory". En J.W. Tibble: *The study of education*. 29-58. Routledge and Kegan Paul, Londres.

---------- (1974): *Knowledge and the curriculum. A collection of philosophical pappers*. Routledge and Kegan Paul, Londres.

HUSEN, T. (1979): "General theories in education. A twenty-five years perspective". *International Review of Education. 25* (2-3). 199-219.

---------- (1988): "Research paradigms in education". En J.P. Keeves: *Educational research methodology and measurement, an international handbook*. 17-20. Pergamon Press, Londres.

KEEVES, J.P. (1988): *Educational research, methodology and measurement, an international handbook*. Pergamon Press, Londres.

KINDELBERGER, J. (1965): *Economic Development.* Mac-Graw Hill, Nueva York.

KHUN, T.S. (1979): *La estructura de las revoluciones científicas*. Fondo de Cultura Económica, México.

---------- (1978): *Segundos pensamientos sobre paradigmas*. Tecnos, Madrid.
LUHMAN, N. (1983): *Fin y racionalidad de los sistemas . Sobre la función de los fines en los sistemas sociales*. Editora Nacional, Madrid.
MARIN IBAÑEZ, R. (1983): "Medio siglo de Pedagogía General". *Revista Española de Pedagogía*. 41 (159), 9-24.
MASTERMAN, M. (1970): The nature of a paradigim. En I. Lacatos y A. Musgrave (eds.): *Criticism and the growth of Knowledge*. Cambridge University Press.
MEDINA RUBIO, R. (1980): "Expectativas socio-profesionales de las cualificaciones pedagógicas universitarias". *VII Congreso Nacional de Pedagogía.* Vol. I. S.E. P., Madrid.
MIALARET, G. (1977): *Las Ciencias de la Educación*. Oikos-Tau, Barcelona.
MITTER, W. (1981): "¿Ciencias de la educación o ciencia de la educación? Algunas consideraciones sobre una cuestión básica". *Perspectivas Pedagógicas. 12* (47-48). 23-35.
MOORE, P. W. (1980): *Introducción a la Teoría de la Educación*. Alianza Universidad, Madrid. (fecha 1ª ed. 1974).
MORIN, E. (1984): *Ciencia con consciencia*. Anthropos, Barcelona.
O.C.D.E. (1968): *The impact of science and thecnology on social and economic development*. París.
O'CONNOR, D. J. (1971): *Introducción a la filosofía de la educación*. Paidós, Buenos Aires.
ORDEN, A. de la (1979): "Enseñanza superior de Pedagogía y formación del profesorado". En A. Escolano et al.: *Los estudios de ciencias de la educación. Currículum y profesiones.* 243-252. I.C.E. Universidad de Salamanca, Salamanca.
---------- (1984): "Investigación pedagógica experimental y praxis educativa". En *Cincuentenario de los estudios universitarios de pedagogía*. 53-72. Facultad de Filosofía y Ciencias de la Educación-Universidad Complutense, Madrid.
PALOP, P. (1981): *Epistemología genética y filosofía*. Ariel, Barcelona.
PEREZ ALONSO-GETA, P. (1985): *Los Congresos Nacionales de Pedagogía*. Nau-Llibres, Valencia.
PETERS, D.P. y CECI, S.J. (1982): "Peer review practices of Psychological Journals: the date of published articles submitteed again". *Behavioral Brain Science. 5* (2). 187-195.
PIAGET, J. (1977): *Biología y conocimiento*. (4ª ed.). Siglo XXI, Madrid.
QUINTANA, J. M. (1983): "Pedagogía, ciencia de la educación y ciencias de la educación". En J. Basabe Barcala y col.: *Estudios sobre epistemología y Pedagogía*. 75-107. Anaya, Madrid.
---------- (1978): "El estatuto epistemológico de las ciencias de la educación". En A. Escolano et al.: *Epistemología y Educación*. 92-118. Sígueme, Salamanca.
REY, A. (1959): *La ciencia oriental antes de los griegos*. Uteha, México.
RODRÍGUEZ MARTÍNEZ, A. (1989): *Conocimiento de la educación, función pedagógica y política educativa*. Tesis doctoral. Facultad de Filosofía y Ciencias de la Educación de la Universidad de Santiago de Compostela (Editada en microficha por el Servicio de Publicaciones e Intercambio Científico de la Universidad de Santiago de Compostela en 1990, con el nº 82). Santiago de Compostela.
RODRÍGUEZ, A., TOURIÑÁN, J. M. et al. (1991): "Formación técnico-profesional y mercado de trabajo". En L. Núñez Cubero (Ed.): *Educación y trabajo*. 151-170. Preu-Spínola, Sevilla.

SANDERS, O. y MCPECK, J. (1976): "Theory into practice or viceversa. Comments on an educational antinomy". *The Journal of Educational Thought. 10* (3).
SANVISENS, A. (1987): *La Universidad española y las nuevas demandas científicas y sociales en el área de las ciencias de la educación.* Universidad de Barcelona P.P.U., Barcelona.
SARRAMONA, J. (1985): *¿Qué es la Pedagogía? Una respuesta actual*. CEAC, Barcelona.
SCHULMAN, L. S. (1986): "Paradigms and research programs in the study of teaching: a contemporary perspective". En M. C. Wittrock: *Handbook of research on teachin*g. 3-6. MacMillan, Nueva York.
SCHUMPETER, M. A. (1949): *The theory of economic development*. Harvard University Press, Cambridge.
SIMON, H. A. (1957): *Models of man, social and rational: Mathematical essays on rational human behavior in a social setting*. Longman, Londres
---------- (1964): "On the concept of organizacional goal". *Administrative Science Quaterly. 9*, 1-22.
STRONG, E. W. (1966): *Procedures and Metaphysics*. Hildesheim, Olms.
TOULMIN, S.; RIEKE, R. y JANIK, A. (1979): *An Introduction to reasoning*. Collier McMillan, Londres.
TOURIÑÁN, J. M. (1984): "La imagen social de la Pedagogía". *Bordón*. (253). 600-630.
---------- (1987a): *Estatuto del profesorado, función pedagógica y alternativas de formación*. Escuela Española, Madrid.
---------- (1987b): *Teoría de la Educación. La educación como objeto de conocimiento*. Anaya, Madrid.
---------- (1987c):"Función pedagógica y profesionales de la educación". *Bordón*. (266), 31-51.
---------- (1988-89): "El conocimiento pedagógico: Corrientes y parámetros". *Revista Educar*. (14-15), 81-92.
---------- (1989): "Teoría de la Educación. Identificación de la asignatura y competencia disciplinar". *Revista de Ciencias de la Educación. 35* (137). 7-36.
---------- (1990): "Profesionalización como principio del sistema educativo y función pedagógica". *Revista de Ciencias de la Educación. 36* (141), 9-23.
---------- (1991):"Conocimiento de la Educación y Función Pedagógica: El sentido de la Competencia profesional". *Revista de Teoría de la Educación. 3*. 11-28
VARIOS (1980): *La investigación pedagógica y la formación de profesores*. VII Congreso Nacional de Pedagogía. S.E.P., Madrid.
VARIOS (1988): *La calidad de los centros educativos*. IX Congreso Nacional de Pedagogía. S.E.P., Alicante.
VÁZQUEZ GÓMEZ, G. (1981): "Apuntes bibliográficos de la ciencia pedagógica". *Revista Española de Pedagogía*. *39* (153), 9-36.
---------- (1984): "La Pedagogía General, ¿ una teoría general de la educación? Problemática actual y perspectivas de futuro". *Cincuentenario de los estudios universitarios de Pedagogía*. Universidad Complutense de Madrid, Madrid.
---------- (1987): El modelo de la investigación en el currículum. En J. Sarramona (ed.): *Currículum y Educación*. (74-94). CEAC, Barcelona.
WALTON, J. (1971): *Introduction to Education: A substantive discipline*. Xerox College Press, Waltham, Massachussets.
WILDEN, A. (1972): *Sistemas y estructura*. Alianza Universidad.
WITTROCK, M. C. (Ed.) (1986): *Handbook of research on teaching*. MacMillan, Nueva York.