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Theory-Practice Relationship and Common Activity as Focuses to Solve Education Problems: Signification of Knowledge of Education¹

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Abstract

This work insists on the importance of the study of theory-practice relationship to obtain specialized and specific knowledge of education: pedagogical knowledge. Education is a real field that people may know in different ways, forms, and types. Several types of knowledge and rationality are useful for making knowledge of education: philosophical theories, practical theories, applied research, substantive theories have let them build it. To a higher extent, knowledge of education has already made particular and specific concepts.

This study establishes differences between knowledge of education and knowledge of disciplines which are used in educative 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 current of knowledge of education has, for solving the problems which arise in the intervention, regarding to theory-practice relationship.

All this has been made by focusing the discussion about the theory- practice connection in three different pedagogical currents (marginal, subaltern, and autonomous). Signification as a principle of methodology is a problem derived from how the theory-practice relationship is understood in each current of knowledge of education to justify valid knowledge. By executing the external common activity, we improve and train the internal activities-capacities: without the activity it is impossible to educate and through the activity it becomes possible for the educatee to be an actor-agent and an increasingly better author-agent of his own projects and acts. We shall see how the pedagogical function generates intervention by means of internal and external common activities. And we can conclude that common activity and theory-practice relationship are focuses to solve education problems from Pedagogy.

Key Words: Knowledge of Education; Educational Knowledge Growth Model; Signification of Knowledge of Education; Principles of Research Methodology; Theory-Practice Relationship; Pedagogical Function; Theories of Education.

1. INTRODUCTION

Education is a real field that people may know in different ways, forms, and types. Several types of knowledge and rationality are useful for making knowledge of education: philosophical theories, practical theories, applied research, substantive theories have let them build it. To a higher extent, knowledge of education has already made particular and specific concepts.

¹A general foundation of this content, in Spanish language, can be found in: J. M. Touriñán (2016), *Pedagogía general. Principios de educación y principios de intervención pedagógica*. A Coruña: Bello y Martínez; J. M. Touriñán, (2017a), *Mentalidad pedagógica y diseño educativo. De la pedagogía general a las pedagogías aplicadas en la función de educar*. Santiago de Compostela: Andavira; J. M. Touriñán (2020a), *Función pedagógica, competencia técnica y transferencia de conocimiento. La perspectiva mesoaxiológica*. Colombia-Nueva York: Redipe-Bowker-Books.

Along the historical events, knowledge of education has grown to achieve a better understanding of facts and decision making. This knowledge is a specialized 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 current of knowledge of education has, for solving the problems which arise in the intervention, regarding to theory-practice relationship. All this has been made by focusing the discussion about the theory-practice connection in three different pedagogical currents (marginal, subaltern and autonomous). The signification of knowledge of education and, on the other side, logical rigor (pertinence), joint with significativity (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.

In this paper, I am trying to systematize the special foundations in each current, because such topics have, really, consequences for pedagogical functions, pedagogical intervention, and pedagogical discourse. In Pedagogy, as a discipline of knowledge of education, it is possible to talk about the meaning of the term 'education' properly and it is also possible to talk about the meaning of the knowledge of education. Besides, it is possible to talk about signification as a principle of pedagogical research. Signification, as a research principle, points to the validity and reliability of meaning, that is, to the methodological value of meaning.

Signification as a principle of pedagogical research (*meaningness, sense of*) is not to be confused with significativity (*relevance, significance, significant*), or with meaning (*concept, definition*) of the term 'education'. Signification, as such a principle, is associated with the validity of the knowledge of education and it is defined as the *capacity to solve education problems* which is assigned to the knowledge of education in each current from the perspective of theory-practice relationship in every educational activity.

Signification as a principle of Methodology is not a problem of Cognitive Pedagogy focused on the *Problem-Solving Theory* that Psychology has settled to explain human reasoning. It is true that the theory of cognitive psychology on problem-solving has made it possible to construct practical theories of education which are used to improve every student's way of knowing. However, when I talk about signification as a principle of methodology, I am talking about an epistemological problem of the knowledge of education, whose study corresponds to the General Pedagogy as a discipline which deals with the methodology of research foundations in education and other topics. Signification as a principle of methodology is a problem derived from how the theory-practice relationship is understood in each current of knowledge of education to justify valid knowledge.

On the other hand, as I shall explain in section dedicated to the pedagogical function, we educate ourselves with internal common activity. But, in addition, we educate ourselves through external common activity (studying, playing, working, inquiring-exploring, intervening, and relating to the self, the other person and the other thing), because by exercising a specific external common activity we activate the internal common capacities, we train them, we exercise them, we drill them, and we improve them to do well each external common activity. The external common activity, by principle of activity, activates the internal common activity in each specific execution of the external common activity, whatever it may be (playing, studying, working, inquiring, intervening, or relating). By executing the external common activity, we improve and train the internal activities-capacities: without the activity it is impossible to educate and through the activity it becomes possible for the educatee to be an actor-agent and an increasingly better author-agent of his own projects and acts.

And this is what I analyse in this article on knowledge of education, through the following sections:

- Diversity of paradigms and homogeneity of criteria in the debate about knowledge of education
- Knowledge of education determines the concept of field of education over knowledge of cultural areas
- Models of knowledge of education evolution
- Currents of knowledge in education
- Knowledge of education and pedagogical knowledge
- Pedagogical intervention and signification of knowledge of education in each current from the theory-practice relationship
- The pedagogical function generates intervention by means of internal and external common activities
- Common activity and theory-practice relationship are focuses to solve education problems from Pedagogy.

2. DIVERSITY OF PARADIGMS AND HOMOGENEITY OF CRITERIA

In 1982 Peters and Ceci made known the results of their research 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 research papers 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 research (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 research questions 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 research has been reported in very diverse works and the international manuals of pedagogical research leave evidence of this idea (Wittrock, 1986; Keeves, 1988). For Schulman (1986) the absence of a singular paradigm of research 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 research, must not be interpreted in an uncontested way. Controversy and polemic are not synonyms of the absence of results. From the context of pedagogical research, we cannot forget that, in any case, this one is a polemic of experts about specialized 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 research, 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 (Biesta, Allan y Edwards, 2014; Boavida y García del Dujo, 2007; Rabazas, 2014; García Aretio, Ruiz Corbella y García Blanco, 2009; Carr, 2006; Pring, 2014; Gimeno, 1982a y 1982b; García Carrasco y García del Dujo, 2001; Touriñán, 2014; Touriñán y Longueira, 2016).

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 intersubjectivable 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 (Touriñán, 2016, 2018a and 2018b).

3. KNOWLEDGE OF EDUCATION DETERMINES THE CONCEPT OF FIELD OF EDUCATION OVER KNOWLEDGE OF CULTURAL AREAS

The level of the current pedagogical researches allows 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 (Tourriñán, 2017):

- 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, et cetera, from the diverse domains the taxonomies mark are being promoted upon working in a special way on that topic. The question, in teaching, is not to know as much about an area as the specialist, but to know what knowledge objectives are achieved and how they are achieved when teaching a subject in the area and what skills, habits, attitudes, knowledge and competencies we are developing when teach 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, speaking in the field of teaching, there is a determined knowledge of education which is not the knowledge of cultural areas: knowledge about the transmission of knowledge content acquired on the cultural area. 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 and researchers from that cultural area; for teaching, knowledge of education would be, more precisely, the knowledge of the strategies for the intervention.

Theoretical, technological, and practical knowledge which 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 can 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. 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 (Tourriñán, 2013c). 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 educated. And as well a historian, a geographer, a mathematician, a physicist, et cetera, 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, et cetera 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, et cetera- 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 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 can 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 pedagogical function in the field of the education begins to be a subject of specialized and specific knowledge. Precisely for this reason we can define the pedagogical function as the exercise of tasks whose performance requires competences which have to be attained through knowledge of education.

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, 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 automatically involve the master of the other one. In logical rigor, we must accept that knowledge of education is, then, a specialized knowledge which lets the specialist explain, interpret and decide the pedagogical 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 pedagogical function, for its meaning principle, demands a specialized 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 pedagogical functions (Tourriñán, 2013a):

- 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 pedagogical 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 pedagogical intervention which characterizes 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 (Tourriñán, 1987c):

- Pedagogical function of Teaching (*docentia*) 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
- Pedagogical functions of assistance to 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 pedagogical 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 organization, the social- pedagogical intervention, the educational planning, et cetera
- Function of pedagogical research, 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.

Someone might think that *educate function* should be added to the collection of pedagogical functions, because educating and teaching do not have the same meaning. To educate is indeed the pedagogue's most exalted function and this function is assumed by Pedagogy in each of the other functions, both considering education as a field of knowledge and as an action. However, since I am referring to pedagogical functions in the strict sense, it is necessary to maintain the difference between the meaning of Pedagogy and the meaning of education. Because of this distinction, it would be a mistake to exclusively attribute the role of educator to whom has completed Pedagogy, as there are educators who are not pedagogues (Tourriñán, 2015).

And this statement, I have just made, should not be taken as a renunciation of action and specialized and specific competence in the pedagogical function, but as a recognition of shared responsibility in the educational task. And so, saving shared responsibility, it must be also recognize that educational competences are included in any pedagogical function, because by principle of nominal definition and by principle of finality on activity, we exercise pedagogical functions and it means that they are so, because they use the knowledge of education to educate: it is not about teaching, researching and assisting the educational system for anything, but about teaching, researching and assisting everything what it may educate. In this discourse, the educational function is present as a quality or sense in the pedagogical functions of teaching (*docentia*), assistance to the educational system and research, which are three different pedagogical functions.

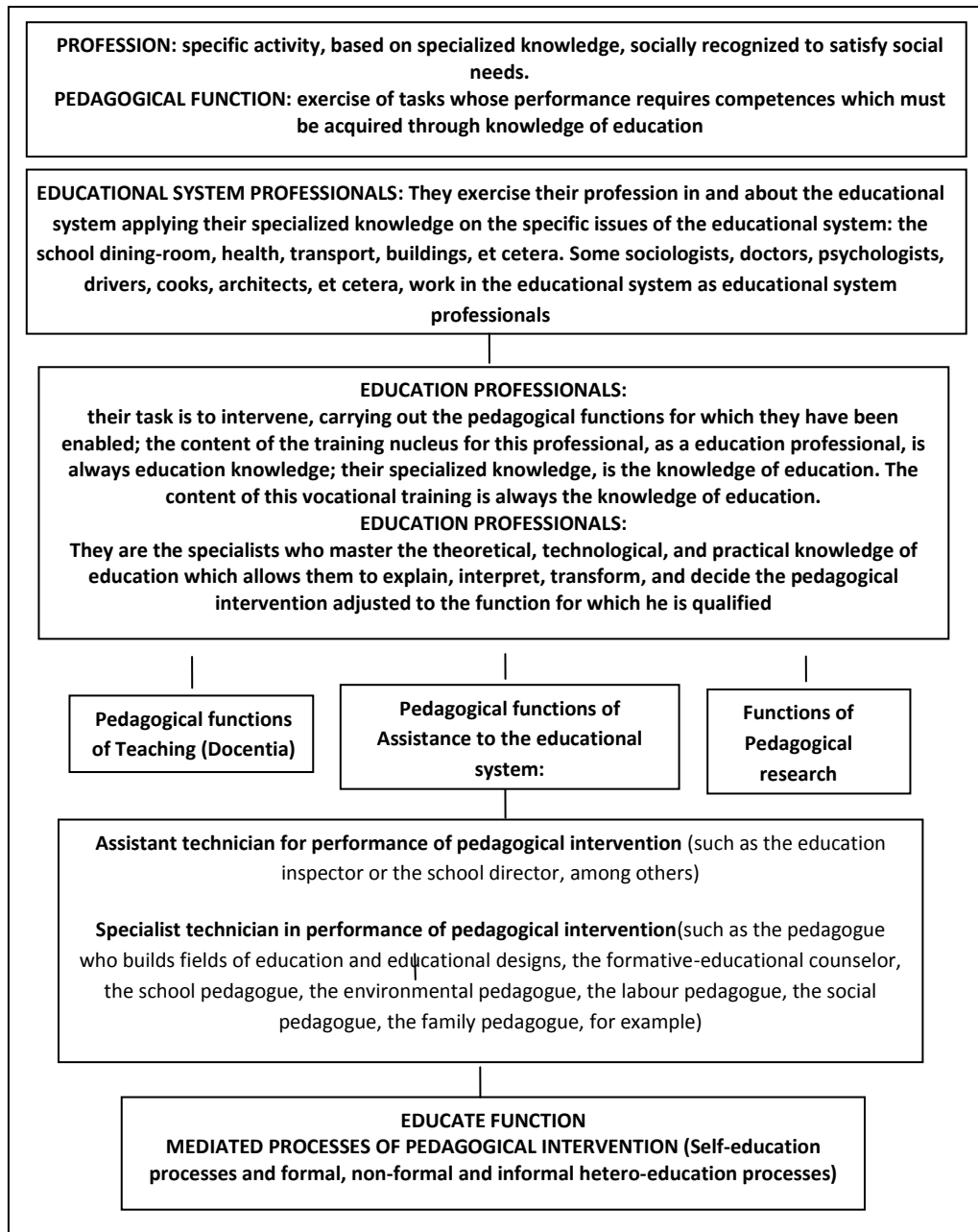
The accomplished distinction between knowledge of cultural areas and knowledge of education allows us to distinguish and identify *education professionals* as professionals different from *educational system professionals*. Regarding this question, we have to say that sociologists, doctors, psychologists, drivers, cooks, architects, et cetera work in the educational system. These professionals properly receive the name of *educational system professionals*, because they exercise their profession in and about the educational system applying their specialized knowledge on the specific issues of the educational system: the school dining-room, health, transport, buildings, et cetera. But, in addition, there is a part of educational system professionals who properly deserve the name of *education professionals*; their task is to intervene, carrying out the pedagogical functions for which they have been enabled; the proper content of the formative nucleus in this education professions, their real specialized knowledge, is the knowledge of education. "*Educational system Professionals*" and "*education professionals*" are two different expressions with different meanings; and it makes sense to affirm that not every educational system professional is an education professional, insofar as only the training content of this professional, as education professional, is always education knowledge. Education professional is the specialist who masters theoretical, technological, and practical knowledge of education which allows him to explain, interpret, transform, and decide the pedagogical intervention adjusted to the function for which he is qualified (Tourriñán, 2017a).

Education professionals carry out teaching functions, pedagogical functions for assisting the educational system, and research functions, always with the ultimate objective of educating in each of them. The pedagogical functions of assistance to the educational system, are functions always referred to the pedagogical intervention, they do not deal directly with the teaching, although they improve the possibilities of this; Its task is to solve pedagogical problems of the educational system that arise with the growth of the educational system and education knowledge, and, if that problems are not corrected, would paralyze educational teaching or hinder the social achievement of quality of education standards through educational system. The pedagogical functions of assisting to the educational system respond to the difference between

knowing, teaching and educating and, as in all areas of reality which have the double condition of field of knowledge and action (in the case of education), they are functions of two types:

Assistant technician for performance of pedagogical intervention (such as the education inspector or the school director, among others) and *Specialist technician in performance of pedagogical intervention* (such as the pedagogue who builds fields of education and educational designs, the formative-educational counselor, the school pedagogue, the environmental pedagogue, the labour pedagogue, the social pedagogue, the family pedagogue, for example). These functions are summarized below in Chart 1.

Chart 1: Education professionals and pedagogical functions



Source: Touriñán, 2020a, p. 145.

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 finalities of education (educational goals) and intrinsic finalities of education (pedagogical goals). It makes sense to establish this distinction within the social system and for the subsystem education because intrinsic finalities 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 finalities 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, et cetera) from the diverse cultural areas constituted in subject of knowledge for teaching are not created by the professionals of education with their specialized 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 finality.

Intrinsic aims, 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 proofs 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 aims) 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, et cetera). 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 finalities 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 finalities 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 my discourse is accurate, as I said at the beginning of this section, it is possible to speak about and to distinguish between knowledge of cultural areas and knowledge of education. But also, as I have argued throughout this section, it is possible to affirm that to know, to teach and to educate have different meanings because the logic of knowing is not the logic of making someone know and because there are some teachings which do not educate. Therefore, it is important to distinguish between education as an object of knowledge (*knowledge of education* or *education knowledge*) and knowledge as an object of education (*the educability of our knowledge; knowledge education* or *cognitive education*), if the expression is allowed.

It is clear for me that:

- Speaking about **knowledges of education** (*knowledges about education; educational knowledges; education knowledge*) 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 an object of knowledge, a cognisable object)
- Speaking about **knowledges of the cultural areas** is speaking about the theoretical, technological, and practical knowledge which the specialists of each area- mathematicians, physicians, psychologists, doctors, et cetera- they have been consolidating with their investigations
- Speaking about **knowledge as subject of education** (*the educability of our knowledge; knowledge education* or *cognitive education*), is speaking about a certain piece of knowledge of education, the one which allows us to participate to improve our way of knowing.

Talking about knowledge of education does not imply questioning directly about the knowledge of cultural areas. When we speak of "knowledge of education", it is more appropriate to ask why certain knowledge constitutes a goal or instrument of educational action or why the cognitive dimension of man is educable.

And as well as the knowledge of each cultural area, the historian, the geographer, the mathematician, the physicist, the art critic, et cetera, could speak to us, depending on the case and with property, because they are specialists in each of these cultural areas, there is no doubt that responding adequately to whether this or that historical, mathematical, physical, artistic content, et cetera, should constitute the content of the educational action that we carry out with a certain agent, or how to cultivate their critical sense, requires questioning about of education as an object of knowledge.

In the first case, the knowledges of cultural areas: history, mathematics, physics, et cetera, are the scientific object of study; In the two cases of the second assumption, the transmission itself and the improvement of the ability to know become a specific object of scientific reflection in the form of Didactics and Cognitive Pedagogy, as the case may be. And so it is, knowledge as an object of education requires research on education, that is, it requires that education become an object of knowledge, either as cognitive pedagogy or as didactics, respectively, but, in addition to responding to what a certain educational event took place and how a certain educational event can be achieved, we must also respond to how that event is justified as an educational event and this is a question that can only be answered from the knowledge we have achieved about the concept of education and the meaning of 'education' is built from Pedagogy. That is the question from Pedagogy, not to improve our way of knowing, nor to improve our way of teaching, but the question of education itself from concepts with intrinsic (autochthonous) meaning to the field of knowledge 'education'. Knowing a cultural area is not teaching, because, as we have just seen, the competencies that are required in each case are different and teaching is not educating, because we can affirm that there are teachings which do not educate, based on the right meaning of both terms.

We must assume without prejudice that pedagogy is knowledge of education and this is obtained in various ways, but, ultimately, that knowledge, by principle of significance, is only valid if it serves to educate; that is, to transform information into knowledge and this into education, from concepts with intrinsic significance to the field of education. On the one hand, you have to know in the broadest sense of the term (I know what, I know how and I know how to do it); on the other hand, it is necessary to teach (which implies another type of knowledge different from knowing the areas of cultural experience; teaching implies making others know). And, as if that were not enough, in addition, it is necessary to educate, which implies, not only knowing and teaching, but also mastering the character and sense of the meaning of 'education', in order to apply it to each area of cultural experience with which we educate. When we comprehend the area of cultural experience *specific pedagogical mentality* and the *specialized pedagogical approach (look)*^{II}, our intellectual concern allows us to distinguish between "knowing History", "teaching History" and "educating with History", understood as a matter of cultural area which is part of the curriculum together with others and it has become from Pedagogy in an *education field*.

Field of education, as used in this context of argumentation, is not a physical space, but a concept derived from the educational assessment of the area of experience that we use as an instrument and goal of education.

^{II} Pedagogue is responsible for making the pedagogical intervention with a specialized approach (look), in order to get a critical vision of his method and his actions, and with a specific mentality, in order to integrate theory into practice and solve the problem of educating in each interaction. *Pedagogical mentality* is a mental representation that the pedagogue makes of the action of educating from the perspective of the theory-practice relationship; refers, from the perspective of action, to the capacity of solving education problems which is attributed to the knowledge of education in Pedagogy, regarding each one of knowledge of education currents.

Pedagogical mentality is a specific one. It is not a general one about life, but about education as a cognisable, and attainable object. Neither is it a philosophical mentality about cosmovisions of the world, of life in general or about the way of life diverse senses, nor should it be confused with the *educational mentality* which conforms to criteria of meaning and temporary formative orientation of educating. *Pedagogical mentality* is a mentality founded on education as an object of knowledge and therefore on the knowledge of education.

Pedagogical approach (look) is the mental representation that the educational professional builds about their technical performance, that is, on their performance as pedagogical; it corresponds to the critical scope that pedagogue has about his method and his acts, this critical vision is based on principles of intervention and principles of education.

Pedagogical approach (look) is, therefore, a specialized one: it is focused on problems of education and technical competence of making a pedagogical approach depends on the knowledge of the education which has been acquired.

Education field is the result of the educational assessment of the area of experience that we use to educate and that is why the meaning of education, the intervention processes, the dimensions of intervention and the areas of experience and forms of expression along with in each technical acceptance of education field are integrated from Pedagogy in the concept of field of education.

Field of education, which is always an expression of the cultural area valued as an object and instrument of education, integrates, as a concept, the following components: area of experience with which we are going to educate, convenient forms of expression to educate with that area, criteria of meaning of education reflected in character and sense traits inherent to the meaning of educating, general dimensions of intervention that we are going to use in education, educational processes that must be followed and technical acceptance of 'field', regarding education. Integrating these components is what makes the knowledge of education with each cultural area to speak with conceptual property of educating "with" a cultural area as a different concept of teaching a cultural area and knowing a cultural area that is part of the curriculum.

If we do not confuse knowledge of cultural areas and knowledge of education, it is not true that the teacher is a learner of the cultural areas that he teaches, nor is it true that necessarily the one who knows the most Art is the one who teaches it best, nor is it true that the one who best masters a skill is the one who best teaches another to master it, unless, tautologically, we say that the skill that masters is that of teaching, nor is it true that, when teaching, we are always using cultural content as an instrument achievement of character and sense proper of the meaning of education, because teaching is not educating. It is the objective of Pedagogy to transform information into knowledge and knowledge into education, building *education fields* from different cultural areas, and precisely for this reason we can say that pedagogy is responsible for assessing each cultural area as education and constructing it as a "field of education" (Touriñán, 2017b).

This is so, because each of these activities requires different competencies and skills for its mastery, and practice and perfection in one of them does not automatically generate mastery of the other. In logical rigor, it must be accepted that knowledge of education is, therefore, specialized knowledge that allows the pedagogue to explain, interpret and decide the appropriate pedagogical intervention for the cultural area that is the object of teaching and education, as the case may be.

4. 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 characterize 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 researches carried out, but, rather, getting to know how the education as an object of knowledge is considered in different researches. It is more interesting the analysis of the hypothesis which allows one to understand education as an object of knowledge in such a way and not in another one, than the productivity of the said hypothesis, that is to say, than the concepts and terminological precessions which 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 characterize in diverse moments education as a subject of knowledge and how it is justified that is the research which must be done about the subject of knowledge 'education'.

This type of questions is ordinarily collected under the generic denomination of *research paradigm*. 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 specialized 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 1987b; 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.

This 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 signification, this understood as a methodologic principle of research, so it is to say, as the capacity this knowledge has for solving problems of education.

So, the established criteria 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 (Tourriñán 1988-89 and 1991).

4.1. Bibliometrical and Linguistic Models

Among the models used to analyse the evolution of knowledge of education it would be adequate to emphasize 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 an object of knowledge, in spite of the fact that the terms pedagogy, science of education and sciences of education have a meaning, referred to different historic moments in that evolution (Mialaret, 1977; Husen, 1979; Mitter, 1981; Vázquez Gómez, 1981 1984; Quintana, 1983; Tourriñán, 1987b).

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. Logically, 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 research 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 researches are being lavished (Escolano, 1983; Pérez Alonso-Geta, 1985). But, although it is true that this 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.

4.2. 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 summarized 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 (Tourinán, 1987a and 1987b) should not be considered as a right categorization of the evolution of knowledge of education because of very different considerations we show in a summarized 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 specialization 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 specialization 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 predominant tendency or even due to be outside the trend.

I 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 subaltern scientific 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 frame of reference without intrinsic meaning which is solved by using the principles of an only generative discipline; in the stage of the sciences of the education different generative 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 subaltern 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.

4.3. 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 complex reality it tries to know:the education.

As well as a living creature regulates and transforms itself 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 organization 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, evidently, an **anorganicist hypothesis**; the one which is thinking analogically the development of a systemic field (the education) as an organic growth.

The economy, the organization 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 (Tourrián, 1987a and 1987b).

Within the simple growth several methods are included to increase the production of knowledge from the configured organization, that is to say, without varying the assumed hypothesis we start from, either applying the configured organization 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 organization (simple intensive growth). Or reorganizing the current systematizing the problems to try and/or improving (not substituting) the way of participating in the reality to be known (simple intrinsic growth) (Tourrián 1987a and 1987b; 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 consider 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 configured 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 (Tourrián, 2017a).

5. 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 (Tourinán, 2016):

- a) Marginal or experiential current
- b) Subaltern 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 type of knowledge to be acquired 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 pedagogical 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 characterizes the pedagogical 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 Chart 2:

Chart 2: Currents of Knowledge of Education

Discriminative Criteria ↓	Marginal current	Subaltern current	Autonomous Current
		Cosmovisionary and Philosophical Studies	Philosophical and Scientific Interpretative
The consideration of education as a subject of study	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 generative disciplines	The education is a subject of genuine study that allows one to generate characteristics concepts of the field
The type of knowledge to be acquired to know education	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 way to solve the act of intervention	The intervention is experientially solved	The intervention is solved by prescription of rules validated with the interpretive theories	The intervention requires generating rules of pedagogical intervention: establishing links and prescribing lines validated with the substantivetheory rules
The possibility or not of getting scientific study and science of education	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 which have intrinsic meaning

Source: Tourinán, 2016, p. 109.

It should be clarified, with respect to ‘marginal’ as adjective that, when we say ‘marginal current’, we are not affirming contempt for Pedagogy in that current. It would be wrong to attribute this intention to supporters of this current. Speaking precisely, the supporters of this current understand that all study of education must be done as they do; studying education is not studying a devalued context; nor study it in a devalued way. On the contrary, education is valuable in this current and supporters apply to it the most valuable ways of knowing, but even so it is a study of a marginal nature in the economic sense of the term.

Into economic context, marginal analysis is an economic analysis focused on boundary zones rather than on the full range of phenomena studied. In other words, marginal analysis studies the utility of one more unit in the complete range of phenomena studied (Tourinián, 1987b).

Although the reason is not economic utility, in pedagogical context, marginal character of Pedagogy means that study of education must be one more part of another object of study. It is not a separate intellectual concern, but only a part of other intellectual concerns: knowledge, the good life, happiness, morality, the idea of man. It is a marginal study in the technical sense; it is a fringe benefit derived from the world and life cosmovision.

Basically, marginal current defends that education is not a genuine object of study, it is to say, it does not have a purpose other than and apart from other intellectual concerns. It is, concretely, a part of another intellectual concern - the aims of life - and a practical activity whose knowledge is resolved experientially.

Subaltern current of knowledge of education, means that subordination is the condition which is assigned to the knowledge of education (Tourinián, 1987b). The basic assumption of this approach is that education is a genuine object of study, it is to say, it has a different purpose than other intellectual concerns. Your goal is to guide action. However, as an object of knowledge, education is solved using exclusively the principles elaborated by the generative scientific disciplines.

On subaltern current, knowledge of education is scientific and subordinated (subaltern) because the structure of justification and interpretation of the rules which are built to intervene is resolved exclusively with the scientific support of generative disciplines theories. It is the validity of the links established in the generative disciplines, which guarantees the validity of the educational intervention rules. In this current, knowledge of education is subordinated regarding to generative discipline.

Autonomous current of knowledge in education advocates that the essential point of pedagogical knowledge is the specific treatment of pedagogical act and not the cosmovisions of the world and of life. Faced with subaltern current, the need to search for the intrinsic significance of educational concepts is defended and the functional autonomy of knowledge of education is postulated.

Functional autonomy means the possibility of conceiving a field of knowledge that develops, not as a consequence of external pressure and recommendations from other fields endowed with a consolidated theoretical structure, but as a result of internal regulations of the field of knowledge itself, in such a way that the theory of that field is limited by the concepts, hypotheses and methodologies of the field itself and not by theories of other fields. Functional autonomy is not equivalent to the defense of absolute independence, it is compatible with a fruitful interdisciplinary relationship and with the defense of the principle of dependence between disciplines. Each of these disciplines is a discipline, because it uses the forms of knowledge appropriate to the best explanation and understanding of the objectual complexity of its field of knowledge; and it is autonomous, because it creates its own conceptual field and its proofs. Their concepts arise from the specific study of the field they analyze and the relationships they discover establish which propositions are significant in each discipline. When autonomy is functional, there is not incompatibility with the existence of dependency relationships between disciplines.

From the perspective of functional autonomy, dependency and subalternation are not the same, because what is proven by the generating disciplines is not pedagogically proven in an automatic way and because using principles of the generating disciplines in education is not the same as developing principles of pedagogical intervention. When there is functional autonomy, the concepts of each matrix, generating discipline, are logically different from those of other generating disciplines and therefore require theoretical, technological, and practical elaboration of their own.

From the autonomous current, pedagogical function is generative of principles. The pedagogical function is not only a user of principles of generative disciplines. Preparing people for pedagogical intervention is to make them skilled in the development of intervention proposals, but that also requires

making them skilled in the development of intervention interpretation schemes, considering the character and meaning of education and generating intervention principles from the structural elements of it.

A different pedagogical mentality is generated in each current. I understand *mentality* as a synonym for “weltanschauung” or world view of the educating action; it is the mental representation of the educating action from the perspective of the theory-practice relationship. The *current* is the frame of interpretation of how we think the knowledge of education is. The *pedagogical function* is identified with the exercise of tasks whose accomplishment requires abilities acquired by means of the knowledge of education. The *pedagogical discourse* is understood as the ordered set of reasonings with a basis on the knowledge of education that allows explaining, interpreting and deciding the pedagogical intervention which is characteristic of pedagogical function to which one is entitled.

Finally, the pedagogical intervention is defined as the intentional action intended to carry out goals and means justified with the knowledge of education. Therefore, for the purpose of this paper, it is important to highlight that (Tourrián, 2017a):

- 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 research or as the assumption. In the context of the discovery in each research, mentality operates as a presupposing; 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 in each research, it operates as the supposed; pedagogical mentality is what is not detailed in research 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 research, demands some **logical rigor (pertinence)** and **significativity (relevance, significance, significant)**. **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** 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 (Tourrián, 1987c):
 - Identifying the conception of knowledge of education that underlies a specific 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, and this 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, et cetera, but all these conceptions are acceptable in the same pedagogical 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, criticizing a current is not a synonym for absolute abandonment of what was considered valuable, as knowledge of education, by the criticized current. The topic is, rather, recognizing 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 research that are paralyzed or hinder the hypothesis, on the other. The critics are not addressed to the fecundity, but the same assumption of each way of considering knowledge of education. From the methodologic perspective, the basic question is not the productivity, but the adequation of limiting the signification of knowledge of education to the capacity for solving problems that are attributed to knowledge of education in each current.

6. 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, subaltern, or marginal knowledge. Sometimes we will need science of education (we will need substantive theories of education for explaining and understanding education in our own concepts, by making 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; to guide the intervention towards socially prescribed ends or to understand the educational intervention in terms validated by other consolidated disciplines, such as Psychology, Sociology, et cetera); finally, we will need philosophic studies of education (in plural) which focus on knowing the consequences that are derived for education from a certain conception of way of life, and, sometimes, we will need philosophical theory of education (in the singular) that focuses on making phenomenological, dialectical, critical-hermeneutical or linguistic analysis of an end in itself, studying the internal logic of the end within the conceptual system of 'education', et cetera (Tourriñán, 2019b y 2020c).

Knowledge of education comes from very different forms of knowledge (see Tourriñán 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.

6.1. Philosophical Theories of Education

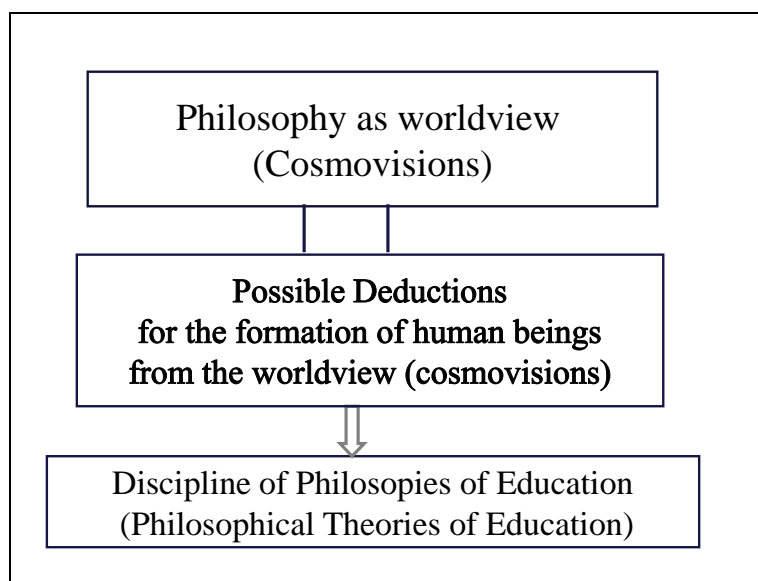
The philosophical theories of education resolve education deductively through conceptions of the world and life. Their objective is the explicit formulation of life interests and the proposal of how to harmonize those interests. Their final proposal is to establish what aim education intends to accomplish, or in other words, their proposal is the normative study of the aims of life in which men should be educated (Tourriñán, 2017a; Fullat, 1979; Bowen y Hobson, 1979; Brubacher, 1962).

The philosophical theories of education provide knowledge about the consequences that would result from each world view of the intervention that is postulated as a priori. They are studies that must be part of the pedagogy professionals' culture (Davis, 1987). However, the capability to generate principles of pedagogical intervention and to explain and prescribe rules of intervention is really scarce in this current because (Tourriñán, 1987b):

- The relationship between theory and intervention is extrinsic
- Reasonings focus on the desirable aims of life and not on the pedagogical goals and rules of intervention
- The problem of education is understood as a moral justification for singular behaviour rather than as a scientific explanation of intentional pedagogical events
- Education is not seen as a distinctive object of study, but as a consequence of other intellectual concerns: world views.

The conceptual structure of philosophical theories of education is deductive, from the conceptions of the world and of life (Chart 3):

Chart 3: Conceptual Structure of Philosophical Theories of Education



Source: Touriñán, 2016, p. 879.

It must be noticed that the previous statements do not invalidate the philosophical theories of education. They rather point out their limitation, to the same extent that they are intended to be used for something that is not their task: explaining how to intervene (Suchodolsky, 1979; García Aretio, 1989; García Aretio, Ruiz Corbella y García Blanco, 2009; Bowen y Hobson, 1979; Carr, 2004; Capitán, 1979; Feroso, 1976; Smeyers, 2010). Sometimes, we will make philosophical theories (in plural) of education, which focus on knowing the consequences that are derived for education from a certain conception of life (this is how philosophies of education or philosophical theories of education, in plural, are made) and, sometimes, we will make philosophical theory of education (in the singular) that focuses on making phenomenological, dialectical, critical-hermeneutical or linguistic analysis of an end in itself, studying the internal logic of the end within the conceptual system of 'education', et cetera (this is how the philosophy of education or philosophical theory of education, in the singular, is done). Philosophy becomes, in this case, a philosophy applied to education or, in other words, an interpretive theory of education (Touriñán, 2019b and 2020c).

6.2. Interpretative Theories of Education

The interpretative theories establish links between conditions and effects of an educational event in terms of generative disciplines, as in the interpretative theories the education does have neither, an own conceptual system nor an own consolidated structure.

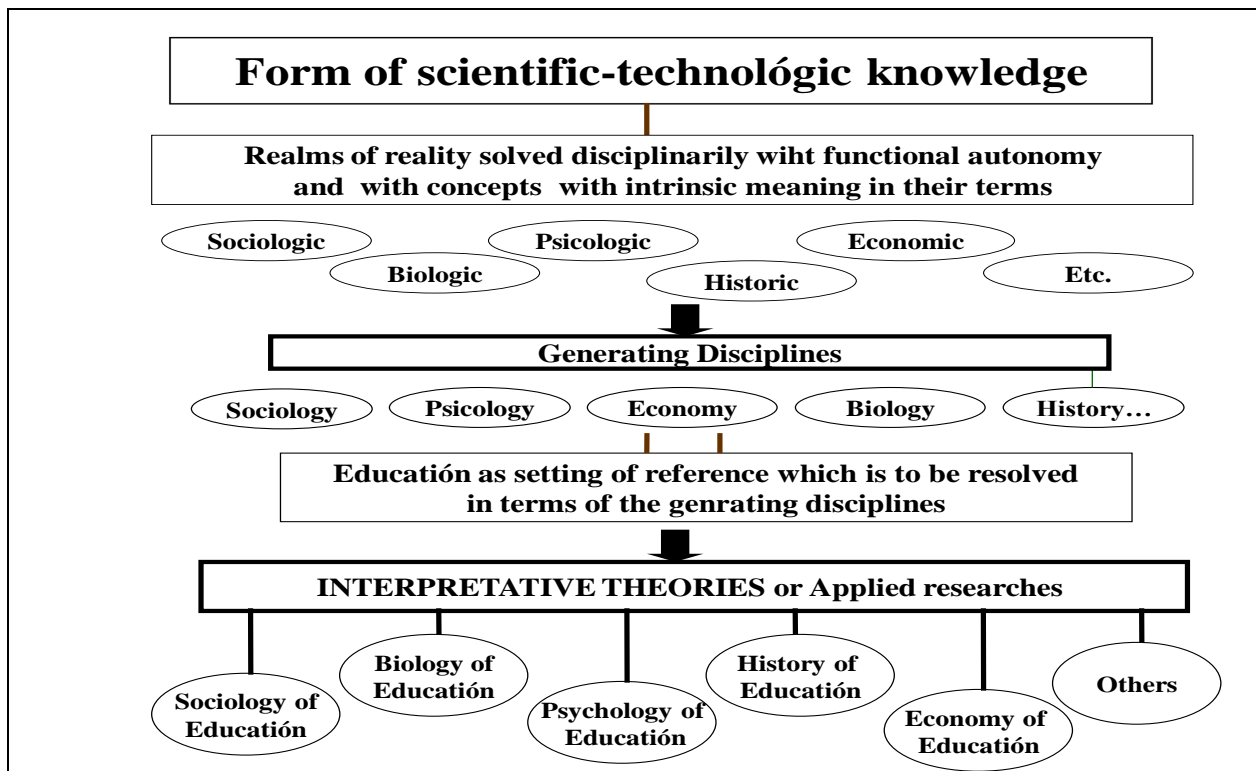
Generative disciplines are those that, following the ontological and epistemological criteria, generate specific concepts of the area of reality that each discipline studies with functional autonomy (Forms of Knowledge + domain of reality to be known + methodological functional autonomy). A discipline which has its own concepts can be applied to the interpretation of other realms of reality as long as these realms conform to those concepts to some extent. In this way, generative discipline becomes an interpretative theory of the field where it is applied, because this field is interpreted through generative discipline concepts.

There are concerns and studies about education that are solved in terms of generative disciplines (they have concepts applicable to education and they interpret it through those concepts), such as Psychology,

Sociology, Biology, Philosophy, et cetera Education can be interpreted in terms of motivation and behaviour, in terms of health and life, in terms of social relations, et cetera In these cases, education is a realm of reality to be studied which is solved in interpretative theories or applied research; in this case we are talking about Psychology of education, Biology of education, Sociology of education, et cetera

The conceptual structure of interpretive theories fits the following common schema for interpretative or generative disciplines, Biology, Anthropology, Psychology, History, Sociology, Economics, et cetera (Chart 4).

Chart 4: The Conceptual Structure of Interpretive Theories of Education



Source: Touriñán, 2016, p. 882.

To the effects of this discourse we consider synonyms applied research and interpretative theory. In scientific literature, the term ‘applied’ has two meanings (Touriñán, 2016):

- 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 research have been opposite to the concept of technological research, giving place to three categories: basic research, applied research and technological research.

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

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

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

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

Both categories have a specific role, regarding to the 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 research, opposite to the interpretative theory, does not allow one to

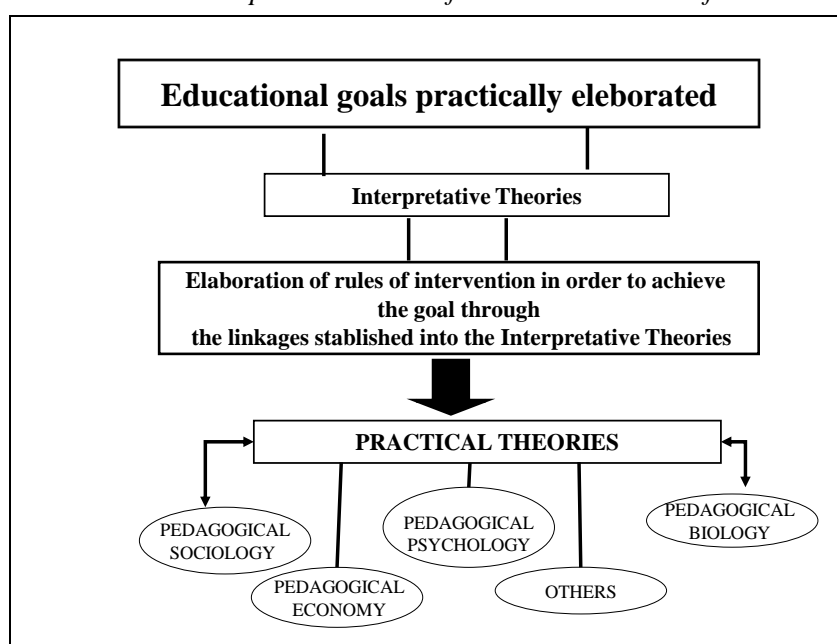
forget the differences between practical theories and substantive technologies. The practical theories as the validity of the goals is not derived from the process but from the social and ethical characters of them, it is suitable as well, to set them with a basis on the practical rationality.

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.

6.3. Practical Theories of Education

The conceptual basic structure of a practical theory, which I am 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 (Carr y Kemis, 1988; Novak, 1977; García Carrasco y García del Dujo, 2001; García Carrasco, 2016; SI(e)TE, 2018). In education, social expectations exist, and it seems impossible to deny, therefore, that it is an adequate field for the development of practical theories (Chart 5).

Chart 5: The Conceptual Structure of Practical Theories of Education



Source: Touriñán, 2016, p. 884.

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 characteristic 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 subaltern for Biology.

6.4. Substantive Theories of Education

Scientific disciplines are understood as generative disciplines within the Autonomous Current of knowledge of education. Generative disciplines are those that, following the ontological and epistemological criteria, generate specific concepts of the area of reality that each discipline studies with functional autonomy (Forms of Knowledge + domain of reality to be known + methodological functional autonomy).

A discipline which has its own concepts can be applied to the interpretation of other realms of reality as long as these realms conform to those concepts to some extent. In this way, generative discipline becomes

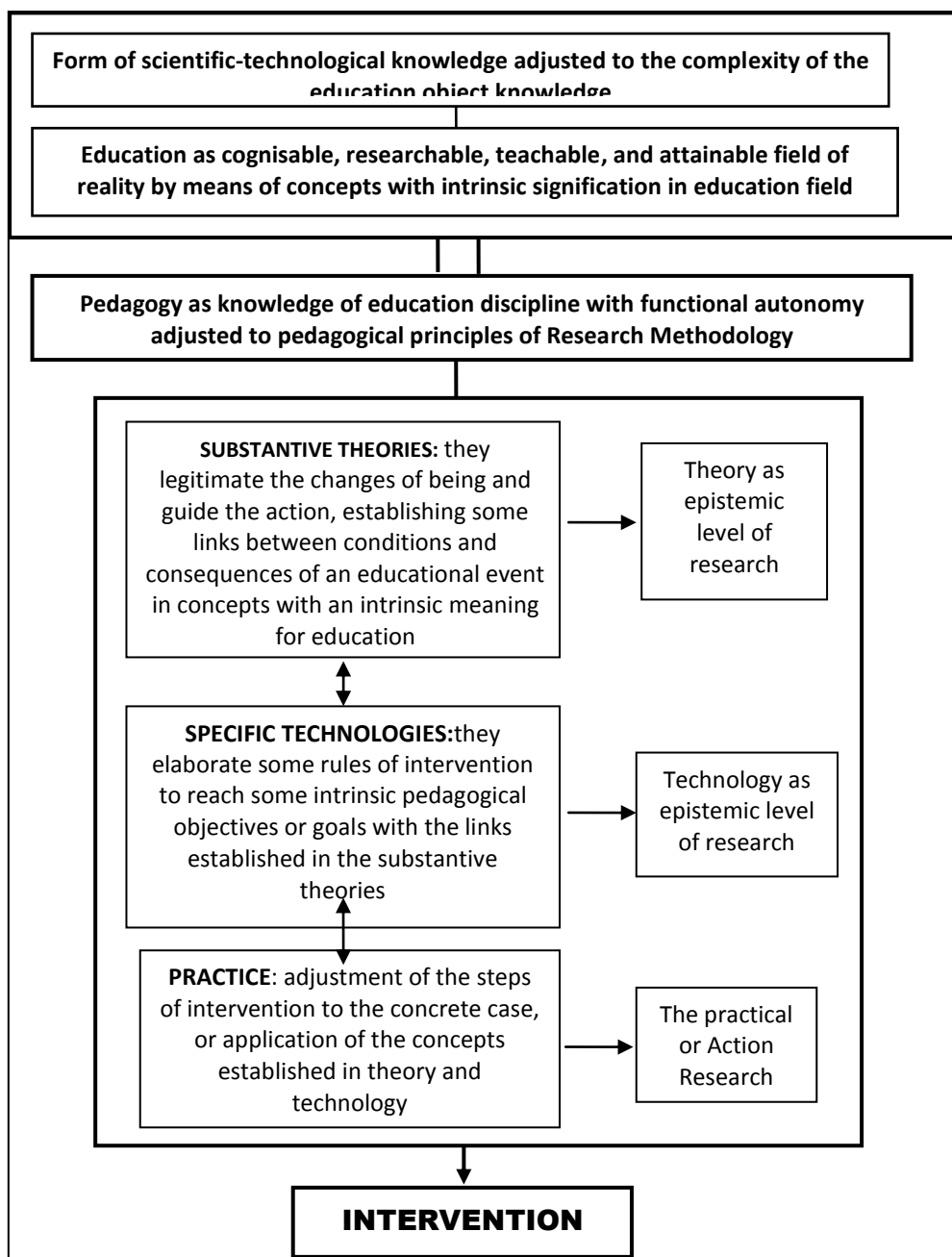
an interpretative theory of the field where it is applied. We interpret the realm where it is applied through the generative discipline concepts.

From this perspective, the concepts of Pedagogy can be used to interpret areas in which education is the context of interpretation and thus Pedagogy generates applied disciplines (Family Pedagogy, Labour (work) Pedagogy, Social Pedagogy, et cetera).

There are three levels of epistemological analysis (theory, technology, and active or practical research) within Pedagogy as an autonomous discipline. They intend to solve the knowledge of education through concepts with a meaning intrinsic to the field of study. The concept of "substantive theory" corresponds to one of the three levels of analysis (level of theoretical analysis, substantive theory) which in Pedagogy are identified as an autonomous discipline of the knowledge of education (Tourinián, 2016; Tourinián y Sáez, 2015, Tourinián y Longueira, 2016; Rodríguez, 2006; Tourinián y Rodríguez, 1993; Tourinián, 2020c).

The basic conceptual structure of a substantive theory is adjusted to the structure on the following Chart 6.

Chart 6: Pedagogy as a Discipline with Functional Autonomy



Source: Tourinián, 2016, p. 887.

Through this approach, it is legitimate to say that Pedagogy as a science of education is theory, technology, and practice of education. So, as I have said, apart from research applied to education and practical theories of education, there is also basic and technological research in Pedagogy (Castillejo & Colom, 1987). The existence of applied disciplines alongside generative scientific disciplines has led to the differentiation between general and applied discipline. It is obvious that different applied disciplines or interpretative theories have been built under this difference in other scientific fields, because they have their own concepts that can be applied to the interpretation of other realms of reality as long as those fields conform to those concepts to some extent. Thus, we speak of general and applied sociology, of general and applied economics, of general and applied biology; Psychology, Medicine, Anthropology, Pedagogy, and other scientific disciplines are spoken of as generative disciplines. But, in each specific case of the existence of general and applied discipline, we are assuming, in the words of González Álvarez, that applied disciplines specialize the task, not the discipline (González Álvarez, 1977).

The psychology of education, the psychology of labour (work), the sociology of education, labour pedagogy, family pedagogy, social pedagogy, et cetera, specialize the task, not the discipline; They are and apply Sociology, Psychology, Pedagogy, et cetera, to different areas, which are susceptible to interpretation in terms of social relationship, behaviour and motivation, pedagogical intervention, et cetera, depending on the discipline which generates the interpretation. In this sense, it is said that labour pedagogy, family pedagogy and other applied disciplines of Pedagogy specialize the task, not the Pedagogy discipline, which remains the same when it applies, the concepts created by itself, to the interpretation of each of the those fields in which they can be applied.

In the case of applied researches, the proof depends on the concepts which belong to the generative discipline (Psychology, Biology, Sociology, Pedagogy, Anthropology, et cetera), since these concepts are the ones that interpret the applied field.

But in the case of functional autonomy scientific disciplines, each discipline depends on its own proofs. From the perspective of Pedagogy as a discipline with functional autonomy which generates its own concepts with significance intrinsic to the field of study, regarding education, it can be said that pedagogically proven is not the same as psychologically proven, because the criteria of meaning of education, in Pedagogy, are not criteria of psychology, nor the meaning of the concepts of education field are reduced to terms of psychology, although these can be used to interpret education. And this is also predicated of the substantive academic disciplines created by division of each generative discipline.

Consequently, when we speak of substantive academic disciplines, for example, general psychology, evolutive psychology, comparative psychology (all of them are disciplines derived from the division of generative discipline 'Psychology', according to ontological and epistemological criteria, because they are not application of Psychology, applied psychology to another area of cognisable and interpretable reality from typical concepts of Psychology), the question is not to specialize the task, by applying the generative discipline to another area or set of problems (to make, for example, psychology of education, art, work, et cetera), rather, within Psychology, the discipline itself is specialized. The applied disciplines specialize the task, because the task is always to interpret another field in terms of Psychology, Sociology et cetera (depending on the matrix discipline), but in the substantive disciplines the scientific discipline itself specializes, because each substantive discipline builds their distinctive concepts and modes of proof on a portion of the matrix scientific discipline (psychology, sociology, pedagogy or others).

Each substantive discipline has its problems and its working methods, depending on its object of study or field of knowledge within the corresponding plot of the matrix scientific discipline. And this is what must be kept in mind when the adjective "general" is attached to a substantive discipline. In the case of Pedagogy, when we speak of substantive disciplines, such as general pedagogy, didactics or comparative pedagogy, we mean that they are all Pedagogy; all have theoretical, technological and practical problems in their field; all are substantive disciplines, but General Pedagogy does not solve the problem of Didactics or the problem of Comparative Pedagogy because, within "education", "pedagogical intervention", "teaching" and "educational system" are three concepts with specific theoretical, technological and practical problems and because the substantive disciplines differ by the plot of knowledge that concerns them (in this case, and taking education as an object of study of Pedagogy, their individualized plots are pedagogical intervention, teaching and the educational system, respectively) and they elaborate their specific concepts, their own contents and

their proofs from the theoretical, technological and practical analyses about the plot of knowledge of education which concerns to each of them.

Each of these substantive disciplines can be applied (like the scientific matrix discipline from which they are born by division of the field of knowledge), to other fields, by specializing the task, and precisely for this reason, we can speak with property of applied disciplines such as labour pedagogy, social pedagogy, school pedagogy, and specific or applied didactics such as didactics of social sciences, and didactics of mathematics, for example.

It follows, therefore, that defining the substantive discipline is not a problem of doing applied pedagogies or of applying the discipline to other areas which can be interpreted those them, neither of making substantive theories, but rather a prior problem, of division of the discipline matrix, Pedagogy. There are applied pedagogies (Pedagogy of work, family, general education, professional education, adult education, social, or others) and there are applied didactics or specific didactics, which specialize the task. The applied disciplines will exist whenever the possibility of applying the matrix discipline advances. The problem of the academic substantive discipline is one of delimitation along with other substantive disciplines of the same rank within the matrix discipline and that all of them have, therefore, their field of knowledge and their knowledge of the field, defined ontologically and epistemologically in relation to the plot that corresponds to them within the matrix scientific discipline. Each substantive discipline makes substantive theory, specific technology, and practice of its individualized parcel of knowledge.

The different ways of understanding the knowledge of education have generated a necessary diversity of theoretical knowledge of education, depending on the type of problems that are being analysed. Sometimes we will need substantive theories of education (to explain and understand education in our own concepts); Sometimes we will need practical theories and interpretive theories (to guide the intervention towards socially prescribed ends or to understand the educational intervention in terms validated by other consolidated disciplines, such as Psychology, Sociology, et cetera); and, sometimes, we will need philosophical theories (in plural) of education, which focus on knowing the consequences that are derived for education from a certain conception of life (this is how philosophies of education or philosophical theories of education, in plural, are made) and, sometimes, we will need philosophical theory of education (in the singular) that focuses on making phenomenological, dialectical, critical-hermeneutical or linguistic analysis of an end in itself, studying the internal logic of the end within the conceptual system of 'education', et cetera (this is how the philosophy of education or philosophical theory of education, in the singular, is done).

Pedagogy, as a discipline with functional autonomy, and interdisciplinary studies of education, or subaltern studies, 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 degree of studies (Touriñán y Sáez, 2015).

Knowledge of education has its most genuine manifestation in the pedagogical knowledge, which is the one that determines the professional action for each pedagogical function. 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 pedagogical 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.

And if it is so, 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 (Chart 7).

Chart 7: Derivation of Pedagogical Knowledge according to the Currents

<u>Discriminating Criteria</u> ↓	Marginal Current Cosmovisionary or Philosophical studies	Subaltern Current Interdisciplinary and interpretative studies	Autonomous Current Pedagogy as a discipline with functional autonomy
Type of knowledge to be acquired to know education	Goals of life and justification of goals. Deductive Consequences for education through <i>Philosophical theories</i>	Means for given goals which link conditions and consequences of an event through <i>Interpretative Theories</i>	Means and goals derived from the pedagogical intervention process through the linkages established into <i>Substantive Theories</i>
The way to solve the act of intervention	Using the experience derived from each singular act of intervention	Using rules and norms derived from Practical Theories and technical applications	Building rules and norms derived from <i>Specific technologies</i> through linkages established in substantive theories
Where does the pedagogical knowledge component come from in each intervention?	From the capacity of resolution of intervention problems by means of theory-practice relationship in the Current	From the capacity of resolution of intervention problems by means of theory-practice relationship in the Current	From the capacity of resolution of intervention problems by means of theory-practice relationship in the Current

Source: Touriñán, 2016, p. 112.

7. PEDAGOGICAL INTERVENTION AND SIGNIFICATION OF KNOWLEDGE OF EDUCATION FOR EACH CURRENT FROM THEORY-PRACTICE RELATIONSHIP

The signification (meaningness) of the knowledge of education, is not to be confused neither with the significativity, nor with the meaning of education, nor with the concept of Knowledge of education. The signification (meaningness) of the knowledge of education is defined as the capacity of solving problems that is attributed to knowledge of education in each current, such as I wrote in Introduction and in Sections 4 and 5. In this sense, “signification” is an epistemic problem of general methodology of research (Touriñán 2016).

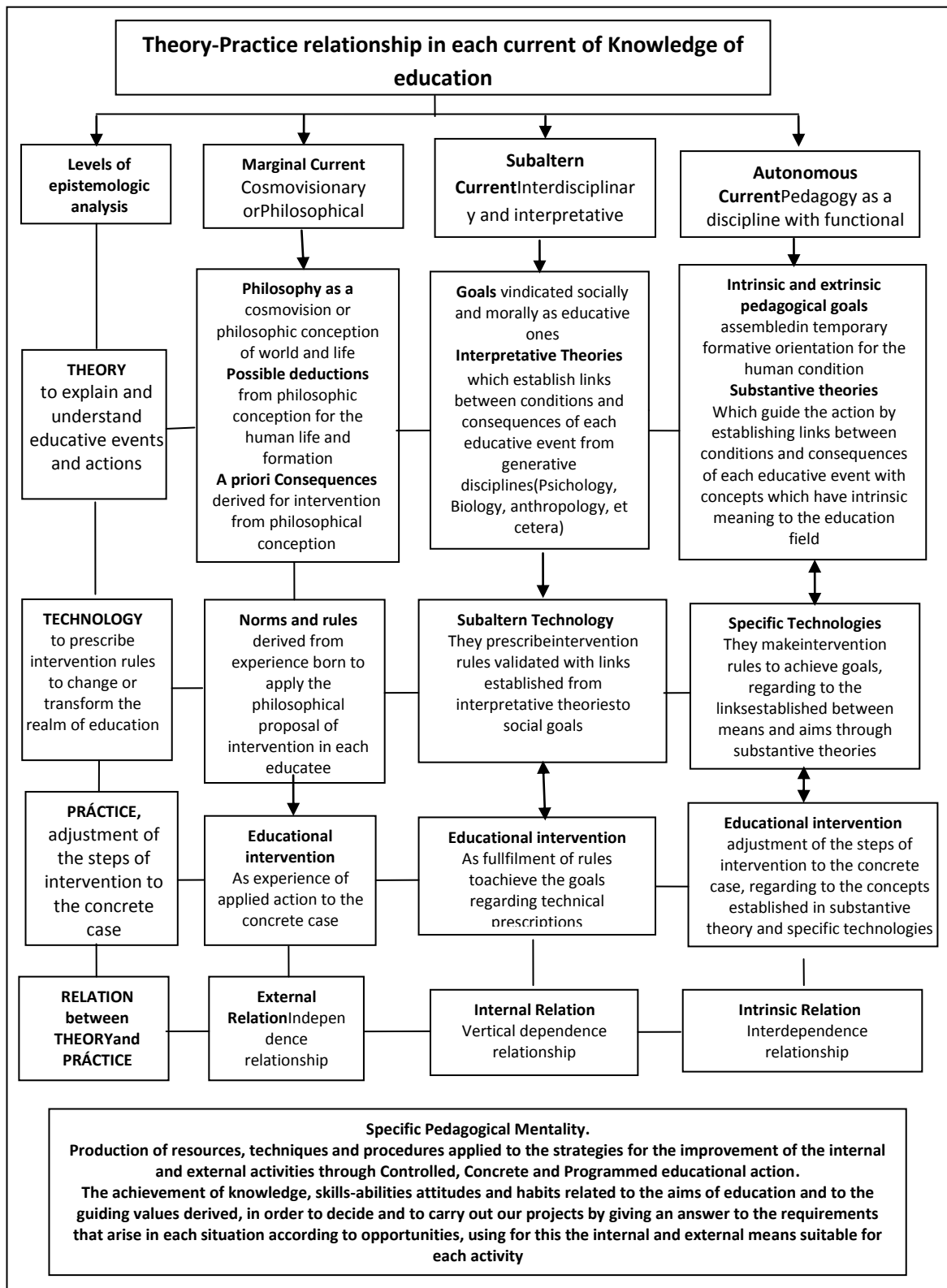
Signification (*meaningness or sense of*), as a principle of research methodology, is associated with the validity of knowledge of education and is defined as the capacity to solve education problems, assigned to the knowledge of education in each current, through the theory-practice relationship approach for every educative action. Each current, as a useful research tool, requires logical rigour (pertinence) and significativity (*relevance, significance, significant*). Besides, the knowledge of education requires signification from the approach of the general research methodology.

Signification, as a principle of research methodology, determines the validity of knowledge of education. Signification as a research principle aims at the validity and reliability of meaning, that is, at the methodological value of meaning. The knowledge of education has signification, if it solves problems of education by relating theory and practice: the better it solves problems by relating theory and practice, the more valid it will be. The more signification it has, the more valid it will be and it is valid if it is useful for educating; and if it is not useful for educating, it has no signification and is not valid.

Signification also means that the knowledge of education is reliable (credible and testable to some extent, it provides confidence); that is to say, what it says is said accurately and precisely. Through the approach of the research methodology, signification is a principle of pedagogical research linked to the knowledge of education which must always solve problems of intervention with validity and reliability.

Each pedagogical mentality generates, as I 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 **Capacity of Solving Education Problems for the intervention** which we are exposing and commenting next, by explaining the basic structure of each (Chart 8).

Chart 8: Capacity of Solving Education Problems for the Intervention through the Theory-Practice Relationship



Source: Touriñán, 2016, p. 115.

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 pedagogical 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 **subaltern pedagogical mentality**, the capacity of solving the intervening problems attributed to knowledge of education is corresponding to the practical Theories elaborated in a subaltern way with Interpretative Theories and 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 generative 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 the one of generative 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 generative 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 subaltern mentality, if an applied rule is not effective in an intervention, it does not cancel the validity of the links established in the generative 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 subaltern current, 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 subaltern current 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.

In autonomous pedagogical mentality, 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 autonomous pedagogical mentality, 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.

8. PEDAGOGICAL FUNCTION GENERATES INTERVENTION BY MEANS OF INTERNAL AND EXTERNAL COMMON ACTIVITIES

In education we carry out many actions to influence the educatee and achieve the educational result. They are always mediated actions of one subject with another or of a subject with himself. And all those actions, which must respect the condition of agent of the educatee, seek to provoke the *activity* of the educatee. In its most common use, 'activity' is understood as a state of activity, it is *activity-state*: activity is the state in which any person, animal or thing that moves, works or executes an action is found at the moment he is doing it (we say: this child is thinking). This use also refers to the *capacity* we have for action in that activity and therefore we can say the child has lost activity (now he thinks less, he has dropped). Because it is the most common use of the term 'activity' as state and capacity, we denominate it *common activity* and it occurs in all people because in all people there is activity as a state and as a capacity to do (Touriñán, 2014 and 2020a).

Regarding common activity, we have to say that current research distinguishes between actions carried out to obtain a result and actions whose result is the action itself. Thus, for example, the action of solving a problem results in something "external" to the action: obtaining a solution (studying results in mastering a subject). In all these cases, the action of solving the problem and having it already solved cannot be carried out. However, I cannot feel without feeling, think without thinking, project without projecting, et cetera. The former are *external activities*, and the latter are *internal activities*. We, from now on, will talk about education, of *common activity* (state activity and capacity) *internal* (result is the action itself: thinking, feeling, wanting, operating, projecting and creating) and *external* (activity, state and capacity, whose result it is external to the action itself, but conceptually linked to the activity itself: I have the ability to play, I have the ability to study, I have the ability to work, to intervene, to inquire-explore, and I have the ability to relate).

From the perspective of common internal activity, we can make a taxonomy of activities taking the educating agent as a reference. We all agree that, when we educate ourselves, be it self or hetero-education, our human condition allows us to carry out the following *internal common activities*: *thinking*, *feeling* affectively (having feelings), *wanting* objects or subjects of any condition, *operating* (choosing-doing things by processing means and ends), *projecting* (deciding-acting on internal and external reality by orienting oneself) and *creating* (building something from something, not from nothing, symbolizing the notation of signs: realizing something *-to note-* and giving it meaning *-to mean-*, building symbols of our culture). Nobody is educated without thinking, feeling, wanting, et cetera To educate oneself is to always improve that internal common activity and know how to use it for specified instrumental activities that make us increasingly capable of deciding and carrying out our projects.

We also agree that, when we educate ourselves, our human condition allows us to carry out the following *external common activities*: *play*, *work*, *study*, *intervention*, *inquiry-exploration* and *relationship* (friend, family member, partner, social, et cetera). They are common activities (state and ability) because I have the capacity for study, play, work, exploration, intervention, and relationship. And they are external common activities, because they necessarily have a result to be obtained, which is external to the activity itself, but which is conceptually linked as a goal to the activity and characterizes it as an identity trait. Hence, we say that studying is having and organizing written information "for" their mastery (mastering or knowing the subject of study); The domain-knowledge of the subject of study is the external result of the activity and this result is the purpose that the study identifies, regardless of whether I can use the study to make a friend, to altruistically help another, to steal better, et cetera, which are uses of the activity as instrumental specifications of it (Touriñán, 2016).

As an external common activity, studying, for example, has its own purpose linked to that activity in a conceptual and logical way (the proper purpose of studying is to master-know what is studied: information, content or the study technique itself).

But, in addition, as an external common activity, studying can become a specified instrumental activity for other purposes, they are specified purposes and external to the activity itself, but linked to the activity of studying in an empirical or experiential way (studying becomes an instrumental activity specified, because we can study to steal, to make friends, to help another, to educate ourselves, et cetera) (Tourrián, 2019a).

It is a fact that common activities are used propaedeutically for educational aims, but they can also be used for other purposes. Common activities can be used to perform instrumental specified activities and they have propaedeutic value; they are preparatory for something later. And this is so, on the one hand, because everything that we use as a means in a means-end relationship, acquires the proper condition of the means in the relationship (the means is what we do to achieve the end and the end is a value chosen as the goal in the means-ends relationship) and, on the other hand, it is so, because the means shows its pedagogical value in the conditions that are proper to it, adjusting the means to the agent, the educational purpose and the action, in each circumstance (Tourrián, 2020b).

From the perspective of internal common activity, we can say that activity is principle of education, because no one is educated without thinking, feeling, wanting, et cetera. And from the point of view of external common activity, we can say that we do many activities whose purpose is to 'educate'. Always, from the perspective of the principle of activity as *the guiding principle of education*: we educate with activity respecting the condition of agent (Tourrián, 2015).

If this is so, it follows that the means must adjust to the activity of the subject and the meaning of education. They are means for a specific subject who thinks, feels, wants, operates, projects, and creates. They are means to carry out activity, playing, working, studying, inquiring, intervening, and interacting. But the agent performs these activities to educate himself: he does not think in any way, but of the one that is built to educate himself and act educatedly, and so on with all activities. It follows, therefore, that any medium is not "the means" for a specific subject; In educational action, the educatee-subject acts with the internal means that he has and with the external means that have been made available to him. And all those means are only educational means if they serve to educate that educatee-subject. The means are not exactly the same if I want to train the critical sense, or if I want to educate the will to produce strength of mind. This is precisely why the tendency to focus on the specific and particular means of an action is explained, forgetting the common and shared means with other educational activities.

Activity is present in all education: from one perspective, as a principle of intervention and, from another, as a principle of education. And precisely because this is so, it is explained that the activity becomes the *backbone axis-principle of education* and represents the real sense of the meaning of education as an activity aimed at the use and construction of valuable experience to generate educated activity. We use the common activity to educate; we educate the appropriate competencies of the common activity and hope to get educated activity. In short, we use the activity in a controlled way to achieve educated activity and educate the activity through the appropriate skills (Tourrián, 2016).

The principle of activity is neither passivity nor activism; it is the use of the activity in a controlled manner to act educatedly. And in this way, activity and control are principles of pedagogical intervention, derived from the condition of an agent who has to construct itself and recognize itself with the other person and the other thing in a diverse cultural environment of interaction, through values he has to choose, commit one self, decide and effect, executing through concrete action what is understood and interpreted in the means-end relationship, expressing it, according to the opportunities.

This is so because, as a principle of activity, no one is educated without thinking, feeling, wanting, operating, projecting and without being creatively interpreting symbols of our culture. We educate ourselves with internal common activity. But, in addition, we educate ourselves through external common activity studying, playing, working, inquiring-exploring, intervening and relating to the self, the other person and the other thing), because by exercising a specific external common activity we activate the internal common capacities, we train them, we exercise them, we drill them and we improve them to do well each external common activity. The external common activity, by principle of activity, activates the internal common activity in each specific execution of the external common activity, whatever it may be (playing, studying, working, inquiring, intervening or relating).

By executing the external common activity, we improve and train the internal activities-capacities: without the activity it is impossible to educate and through the activity it becomes possible for the educatee to be an actor-agent and an increasingly better author-agent of his own projects and acts.

The principle of activity allows us to affirm in Pedagogy that external common activity (for example, playing) activates the internal common activity of thinking, feeling, wanting, operating, projecting, and creating, but that does not mean falling into activism: do activity just for the activity does not educate; to think in any way is not to educate oneself, since getting educated, at a minimum, requires that, when we are thinking, the habit and way of thinking has to be improved.

For all that, education is everyone's problem, and we all contribute to it because we all have to become educated and we have to use common activity to educate and educate oneself and it is not possible to do so without it.

9. FINAL CONSIDERATIONS: COMMON ACTIVITY AND THEORY-PRACTICE RELATIONSHIP ARE FOCUSES TO SOLVE EDUCATION PROBLEMS FROM PEDAGOGY (EITHER AS A MATRIX SCIENTIFIC DISCIPLINE, OR AS INDIVIDUALIZED SUBSTANTIVE DISCIPLINES, OR APPLIED DISCIPLINES)

As I said, in Section 6.4 of this paper, Scientific disciplines are understood as generative disciplines within the Autonomous Current of knowledge of education. Generative disciplines are those that, following the ontological and epistemological criteria, generate specific concepts of the area of reality that each discipline studies with functional autonomy (Forms of Knowledge + domain of reality to be known + methodological functional autonomy). A discipline which has its own concepts can be applied to the interpretation of other realms of reality if these realms conform to those concepts to some extent. In this way, the generative discipline becomes an interpretative theory of the field where it is applied. We interpret the realm where it is applied through generative discipline concepts. From this perspective, the concepts of Pedagogy can be used to interpret areas in which education is the context of interpretation and thus Pedagogy generates applied disciplines (Family Pedagogy, Labour (work) Pedagogy, Social Pedagogy, et cetera).

There are concerns and studies about education that are resolved in terms of generative disciplines (with concepts applicable to education and interpreted from those concepts), such as Psychology, Sociology, Biology, et cetera Education can be interpreted in terms of motivation and behaviour, in terms of health and life, in terms of social relationships, et cetera In these cases, education is an area of reality to study that is resolved in interpretive theories or applied research, in this case we are talking about psychology of education, biology of education, sociology of education, et cetera

And if this is so, it follows that the important thing is, in our case, to go from General Pedagogy to Applied Pedagogies, because very diverse fields of knowledge can be interpreted in terms of the generative discipline, as applied disciplines, provided that this scope is capable of being interpreted from the concepts that generative discipline has created. It is a fact that there is (family, labour, social, environmental, prison, gerontological, arts, literature, et cetera) Pedagogy, because fields of knowledge (family, work, the social, the environment, et cetera), can be interpreted in concepts constructed by Pedagogy for the object "education". The key, from applied pedagogy, is to transform the field of knowledge to which it is focused, by interpreting it in terms of Pedagogy, in order to, in this way, build a education field, make an educational design and generate a pedagogical intervention which materializes the content of the expression "educate WITH" each of these fields (Tourriñán, 2017b, 2020c).

And to materialize the content of the expression educate WITH, from the applied discipline, or from the matrix scientific discipline, or from the academic substantive discipline which is detached from that, we establish the knowledge that relates theory and practice in each case and we ensure, by means of the capacity to solve problems in each intervention, the educational use of internal and external common activity.

Finally, as we have explained in the section dedicated to the pedagogical function, we educate ourselves through internal common activity (*thinking, feeling affectively, wanting, operating, projecting and creating*). But, in addition, we educate ourselves through external common activity (*studying, playing, working, inquiring-exploring, intervening and relating to the self, the other and the other*), because by exercising a specific external common activity we activate internal common capacities, we train, exercise, drill and improve them to do well every external common activity. The external common activity, by principle

of activity, activates the internal common activity in each concrete execution of the external common activity, be it playing, studying, working, inquiring, intervening or relating.

By executing the external common activity, we improve and train the internal activities-capacities: without common activity it is impossible to educate and, thanks to activity, it becomes possible for the educatee to be an actor-agent and an increasingly better author-agent of his own projects and acts.

One must educate, and this implies that cultural experience area must be interpreted from the *specific pedagogical mentality* and from the *specialized pedagogical approach (look)*. On the one hand, we make a critical vision of our performance, adjusted to principles of education and principles of pedagogical intervention and, on the other hand, we mentally represent the action of educating from the perspective of the theory-practice relationship.

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