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ABSTRACT
        This paper examines the role of developmental psychology in
reflective practice, using examples from the Department of Psychology at the
University of Turin, Italy, and from a regional institute that deals with
continuous teacher training. After introducing the topic and discussing the
need for continuous teacher training, the paper presents information on
general theoretical premises and the construct of change. It goes on to
discuss the specific theoretical model (the recursive schemata of Mounoud).
Next, it describes a training course, based on Mounoud's theoretical
principals, that involved 35 primary school teachers (all of whom had a
university degree in psychology or pedagogy and were willing to undergo
theoretical study and subsequent assessment of the learning achieved). In the
training model, mentors held the role of mediator between theory and practice
and between university and school. A study of the course indicated that it
allowed teachers to gain a knowledge of the whole developmental process and
to reflect on how social, affective, and cognitive elements were interwoven
in their students' daily lives. Surveys of the teachers indicated that they
accepted the theoretical issues when they were allowed to consider theory as
a useful tool for intervening more efficiently at the operative level.
Overall, the researchers concluded that the intervention model and contents
of the course were effective. (Contains 69 references.) (SM)

FROM KNOWLEDGE TO ACTION:
THE ROLE OF DEVELOPMENTAL PSYCHOLOGY
IN REFLECTIVE PRACTICE

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1. Introduction

With regard to continuous teachers' training, it might appear to be unnecessary to mention the connection between knowledge and action, since we are speaking of professionals and this relationship should therefore be fully accomplished. In reality, the expertise of a professional consistes of both theoretical knowledge and working skills. But in Italy the real situation, at least with regard to primary-school teachers, is very different: theory and reality are considered to be two completely unrelated domains.

This state of affairs is partly due to the fact that Italian Educational Research has made little use of accurate quantitative and qualitative methodologies and has even less often referred explicitly to the results of studies in Cognitive Psychology and Neuroscience. In this way, Educational Research has often been restricted to the philosophical domain and has not been able to work according to Heisenberg's statement that science develops "in immediate connection with its practical application, and the latter is, in the last analysis, the authentic unit of measurement for the truth of any knowledge reached" (Heisenberg, 1942, tr.it. 1991, p. 131).

In part the responsibility for this situation must to be ascribed to individual teachers' attitudes: the frequent rejection of theory originates from the concern that one's own beliefs, practices and methodologies, as well as "one's personal theories" (Calderhead,1987; Mitchell, 1994; Marland &Osborne, 1990), acquired with great difficulty, may be questioned, with the risk of falling back into that uncertainty, characteristic of the beginning of one's career.

On the one hand, teachers lack the theoretical knowledge that should be the necessary reference-point for their work; on the other hand, their working skills are often restricted to a specific context and it is thus not possible to generalise them to different situations or transmit them to other colleagues. The consequences are: confusion when facing unforeseen problems, which at present are increasing at school, and an inability to find original solutions for them. The solutions found by teachers often belong to the "do-it-yourself" school (Lévi Strauss, 1974; Haton, 1993; Ribolzi, 1995): they have a "tool box", built in the main themselves, but rarely possess true professional instruments originating from an intellectual project and related to theoretical notions.

Moreover, the lack of initial training at university level and the fragmentary and non systematic nature of continuous training has not yet made it possible to overcome this state of affairs. Currently, teacher training in Italy seems therefore to be characterised by the following elements:
- an almost total separation between theory and action and, in particular, a lack of a theory that can play a "unifying" role;

- a hierarchical relationship between training course lecturers (who present themselves with expert authorities) and teachers (simply considered as pupils);
- a mechanistic approach to teachers' learning, which is unlikely to lead to recognition of the teachers' active role in the construction of their own knowledge;
- the haphazard nature of course contents;
- the lack of adequate reference to the children to whom the teachers' actions are addressed.

The most serious consequence of this situation is that only a few continuous training courses lead to any real change in teaching practice. Nevertheless, at present the problem of teachers training, particularly that of primary school teachers, is becoming one of the core issues, both at university and school levels, because of two significant changes:

a) at the university level, degree courses for initial teachers' training for the elementary school (so far limited to secondary school and strictly linked to the dimension of contents), are now opening for the first time;

b) at the school level autonomy has finally been achieved for individual schools, attributing to each the power and responsibility to organise continuous teacher training, through collaboration with university and other institutions.

The simultaneous nature of these two events offers both the possibility to reflect carefully about the links that should exist between initial and continuous training, and especially to avoid the disadvantages listed above. This may also enable the present inconsistency of different training courses to be eliminated even if those take place at different times, they must be focused on some common elements and to combine them into a more organised and consistent project.

In this general framework, the experience of the Department of Psychology at the University of Turin and by IRRSAE of Piemont Region (the Regional Institute which deals with continuous teachers' training) may be taken as a reference model, both because of the contents proposed and the methodology used.

2. General theoretical premises

Generally speaking, the main goal of training activities is to produce a lasting and deep change in the teachers. Nevertheless, this change is usually considered as a sort of "private enterprise", since the role played by the individual's network of relationships and his/her historical, family, and socio-cultural conditions, all contributing to his/her development, is not acknowledged. Certainly we are aware that in a single training course it is not possible to modify the more general aspects of individual development: but it is at least possible to contribute to *co-determining*

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teachers' development (Baltes & Reese, 1984) by applying a systematic and organised process, which means a process designed around precise theoretical options.

To talk about co-determination of learning implies attributing an active role to the subject, letting him/her become not only the main protagonist but also the *commentator* of the knowledge acquisition process (Fabbri, 1994).

In our opinion, this aspect attributes a specific meaning to the reflective practice, which is no longer considered to be centred only on the individual (and thus internal to his/her thinking) but is aware of the external conditions that allow it to exist and of what the subject externalises of his/her cognitive functioning. If reflective practice implies the ability to decentralise themselves from daily reality and to open to others' influences (Day, 1991), it is impossible to think that all this can be realised by the teacher appealing only to his/her own force or without sharing his/her thinking with others.

2.1. The construct of change

First of all, to assume the concept of *co-determination* as central in reflective practice means to clarify the core construct of change according to life-span approach principles (Baltes, 1987; Rutter & Rutter, 1992) and to define the role that learning plays in achieving change.

The centrality of the construct of change in a training course may seem tautological, since training cannot be achieved without change. In a training process informed by the principles of reflective practice, the most important aspect is the change occurring within the individual, that is the differences shown by one and the same individual at different times (Ford & Lerner, 1992). This change is characterised both by a qualitative dimension, linked to the differentiation of progressive abilities (as long ago stressed by Werner, 1940), and by quantitative elements, linked to the acquisition of new knowledge. As a result it is impossible to face the problem of change without considering *what* and *how much* the individual learns (Lindeman, 1926,Knowles, 1990).

It is generally acknowledged that the relationship between change and learning is two-directional (Cronbach, 1963; Gagné, 1965; Hilgard & Bower, 1966), but usually great difficulty is met in identifying exactly what makes learning possible. Besides, it has been pointed out that, regarding adults' learning in particular, further specifications are needed.

Lindeman (1926) held that adults are generally not available to learn something compulsory simply because of the hope that this information will be useful in the future, sooner or later, but that, on the contrary, they start from the consideration of the real situation in which they live. On this basis, Knowles (1990) asserted that learning must be organised around didactic units represented by real situations, and not around theoretical subjects.

The application of these principles leads to emphasising the role of experience, in consequence to attributing greater importance to experiential methodologies (group discussions, simulation exercises, problem solving activities, etc.) than to transmitting techniques.

In this connection, therefore, the possibility of realising any experiential techniques without a previous process of acquiring knowledge, including also "transmission", should be questioned. In our opinion this is not possible, especially when adults must acquire new knowledge. Besides, referring to experience does not decrease the importance that should be accorded to theoretical knowledge for at least three reasons:
□ First of all, to talk of experience implies collocating oneself on a higher level than that of the mere situation of the moment. Experience involves referring to a series of mental operations (in particular, abstraction and generalisation) which lead in the direction of conceptualisation and therefore towards theoretical knowledge.
□ Secondly, it is precisely the theoretical knowledge that functions as a filter and lets individuals learn from their experience. As stressed by Day (1991), it is through his/her theoretical knowledge that the subject becomes able to go beyond subjectivity.
□ Finally, to restrict the experiential field may represent a danger: not to be able to modify teacher's personal theories.

Thus, in a training course, experience must be complementary to theoretical knowledge and not the only point of reference: rather, it is necessary to create a recurrence between more theoretical and more operative phases.

This recurrence can also be justified in terms of the life-span approach. According to the central concept of this theoretical perspective, there are new possibilities of development at every age and for every type of behaviour (Rutter & Rutter, 1992). The individual is characterised by plasticity not only during childhood but at every age of life (Demetriou, Doise, Van Lieshout, 1998).

Transferring the concept of plasticity to the training process could mean that the issues of Lindeman and Knowles, at least in part, lose value and that during adulthood systematic teaching involving information transmission can still play a role, especially if it is concerned with learning new knowledge. In that framework, referring to experience may play the role of motivational factor.

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3. The specific theoretical model: the recursive schemata of Mounoud

The recurrence of knowledge and action constitutes the intrinsic character of all scientific research, in which experimental inquiries are always preceded by reference to theories and models, and in the end return to them.

In particular, Piaget's methodology was characterised by this recurrence (because he always started from a theoretical perspective to invite students to imagine experimental situations) that also represent one of the core contents of his theoretical reflections. The title of one of his books, *Réussir et comprendre* (1974a), explicitly recalls the existence of the two references; through this work Piaget completed the analysis begun in another book, *La prise de conscience* (1974b).

According to Piaget, *to manage* means, through actions, to understand a particular situation enough to be able to reach the goals set, while *to understand* means to be able to dominate the same situation through thought, until one is able to solve the problems that may arise from it, with regard to the *why* and the *how* of the links perceived and elsewhere used in action.

Piaget's clarification enables us to identify the greatest problem of teachers: they are characterised by several "practical" skills, which remain at the implicit level and are realised through action, and have great difficulty reaching the level of true understanding, which according to Piaget is hierarchically beyond the simple ability to manage something.

Gardner (1983) also mention the difference between *know-that* and *know-how*, defined previously by Ryle (1949), but unlike Piaget he seems to place a greater emphasis on awareness of the procedures and on the capacity to talk about them.

Within the theoretical framework of the authors quoted above, action and thought therefore seem to belong to quite different domains, one following the other in time and not substantially recursive.

If the model which derives from it (action → thought) may function in some situations, it does not function at all for teachers, and this limitation may be explained by referring to the systemic paradigm.

The theorisation which led, through subsequent specifications, from the General Theory of Systems (von Bertalanffy, 1969) to the Theory of Living Systems (Miller, 1970) and finally to the Theory of Developing Systems (Ford and Lerner, 1922) emphasised the importance of two elements: interaction and feedback. The latter characterises the functioning of all open system, but for teachers it is especially the former, feedback, that takes on a specific professional value. All teachers are constantly in the situation of putting into practice an action that was previously

planned in thought and from which signals return that, in their turn, lead to modification of the subsequent action.

The model regulating the teacher's action is therefore a recursive one: knowledge → action→ knowledge → action...

Considering that a training situation, in order to have a deep influence, should be able to create situations similar to those that are actually experienced (as stressed by Lindeman and Knowles, already quoted above) we believe that this model should also regulate the methodology of training with an extra and specific emphasis on the theoretical contents (for the reasons already explained at point 2.1).

On this basis, the most satisfactory model appeared, in our opinion to be that of Mounoud (19--). Although most of Mounoud' studies relate to the developmental age of childhood, we feel that the general principles of his theory can easily be extended to adults.

According to Mounoud, practical intelligence and conceptual intelligence are not "following stages of development of the single individuals or different modalities of knowledge [...] but instead two different states that representation may take on, again and again during development and within each stage of development. When conceptualisation reacts implicitly in previously constituted and stratified system of knowledge, representation takes on procedural form; on the contrary, it takes on the conceptual form when conceptualisation becomes explicit in connection with the construction of new forms of representation (Fabbri & Fameti, 1995).

From Mounoud's theory, three key principles may be extracted:
❑ thought (as a cognitive ability) is predominant in human life and its presence (conscious or unconscious) may be seen in all human action.
❑ thought "exists" in action and re-creates new programmes of action. Therefore each organised action shows a previous conceptualisation, even if this is not necessarily accessible to awareness.
❑ action constitutes a translation of thought, both in the implicit form (when already elaborated and stratified systems are in function) and in the explicit form (in the phases in which a new system of conscience is construed). Thus action is not simply reducible to a pre-requisite of thought.

4. Methodology

Analysis of the Italian context brings to light two key elements:
❑ The necessity of organising training courses which allow teachers to solve actual problems, and in which the acquisition of new abilities and new instruments does not occupy too much time.

❑ The impossibility of avoiding a pathway of reflection not only linked to specific situations but able to promote evolutive change (Ford and Lerner, 1992).

Training therefore must be based on the active consent and participation of subjects (Demetrio, in Bonino, 1994), according to the cognitive viewpoint about the crucial role played by an individual's personal history and by his/her emotional and motivational sphere (Pask, 1975; Bruner, 1990).

In our opinion, however, it is not possible to ignore that, within training addressed to teachers, there is an element which, even if is not present at the phenomenological level, has a strong influence on the progress of the training: the pupils. It is within the relationship with them that the teacher feels the need for training, expresses particular demands in terms of contents and methodologies, carries out his/her change.

Moreover, reference to the teacher's pupils must not simply to be viewed from the viewpoint of Knowles (1990), that adults are available to learn what they need to know and to know what to do in order efficiently to face situations in their real lives. We believe that, within a training context, a relation exists between teachers in training and their pupils, with similar characteristics to those attributed by Bronfenbrenner to the primary dyad (1979, tr.it 1986, p. 104): that of "continuing to exist phenomenally [...] even when its member are no longer together". Having their pupils mentally present, continuing to "think of" the children with whom they have daily contact, referring constantly to their "comfort" (Sacks, 1985) becomes then the key of the reflective process activated by the teacher. Indeed, if the training process is to lead to a greater intentional action (Dennett, 1987), the reference to pupils with whom the teacher interacts facilitates the process. Thus the training plan must be centred on this "virtual" subject, so powerful and influential.

The above-mentioned considerations have helped us to construct action around three polarities:
    ❑ the teacher-pupil relationship
    ❑ the relationship between training context and school context
    ❑ the theory-practice link
which have taken the concrete form of some assumptions whose role is that of guiding principles:
a) general abilities exist in children (the ability to thinking, for memory and linguistic expression, abstraction and generalisation, problem-solving and narrative thought) (Craig, 1992) that have a direct influence on learning and that must therefore constitute the object of the teacher's specific attention;
b) inefficiency of teaching action starts almost always from insufficient knowledge of the way in which such abilities develop and their characteristics at different ages. Consequently, teacher intervention is often located far beyond the zone of proximal development (Vygotskij, 1930-31) and thus doomed to failure;

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c) in the process of "scholarisation" the primary school assumes the character of "critical period" (Osterrieth, tr.it. 1965; Craig, 1992) and its influence takes the form of an "experience-dependent" situation (Greenough, Block, Wallace, 1987);

d) it is not necessary to give to teachers pre-formed theories which "explain" by applying external categories. One needs instead to use theory as a tool which allows "understanding" starting from the internal state of the teacher, from his/her thoughts, feelings and will.

From such starting assumptions, the following points derive:

❑ reference to Developmental Psychology, from the viewpoint of life-span approach (Rutter & Rutter, 1992), as a discipline which allows the teacher to understand the reasons for his/her way of working, and to perceive the inconsistency between his/her action and the reality of the children. Teachers constantly have the image of their pupils in mind and this picture acts as a filter for the learning they achieve. As a consequence, the theories they construct are "context-specific" (Mitchell, 1994). These theories may seem very efficient, but they often easily lead to incorrect interpretations. In our opinion it is possible help teachers to go beyond these limited theories if they are induced to reflect on the fact that each child, in his/her individuality and uniqueness, cannot be reduced to a single theory. To be able to understand children one needs to refer to different theories, each of which studies and defines one aspect of development.
The proposal of the contents of Developmental Psychology according to the life-span approach may allow us to reach this result. Starting from the concept of development as a process which is not unidirectional, consisting of gains and losses, of increases and decreases, of continuities and discontinuities, in which every "marginal movement" leads to completely different results (Rutter and Rutter, 1992; Ford and Lerner, 1992; Demetriou, Doise, van Lieshout, 1998) helps to have an effect on the profound nucleus of theory which every teacher has constructed and often on the basis of information received from non-scientific sources.

❑ the methodology of training based on the recurrent/recursive model of Mounoud
knowledge →action→ knowledge →action
and on the intervention of a tutor with the task of facilitating the realisation of such inter-relation.

4.1. Procedures

Putting Mounoud's theoretical principles into practice within a training course is not easy because the teacher's action is delayed with respect to learning and cognitive processing.

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a) A phase of acquisition of theoretical knowledge, aiming to enable the teacher to go beyond personal theories, to make him/her aware of the reasons for acting, and to identify the key concepts around which the reflective process must be realised. This phase involves the intervention of an expert (from the university) and the reading of theoretical works. It is unashamedly predominantly a form of "transmission", although interaction of the listeners is not excluded.

b) The constant presence of a tutor who interacts both with the teachers and with the expert, immediately stressing the relationship between theory and daily school reality and promoting reflection.

c) The allotment of practical exercises (small field research projects) that each teacher must implement with his/her pupils.

d) The tabulation and interpretation of data collected through the exercises.

e) Return of data to the teachers, followed by a discussion aimed at showing the positive and the negative aspects of their behaviour and at examining this behaviour in the light of the theoretical principles faced at first hand.

The different steps have been organised with reference to contents of Developmental Theories.

4.2. Contents

The concept of development of today's psychology is the result of abandoning the deterministic paradigm and moving towards the probabilistic paradigm, which in its turn evolves into the theory of chaos.

It is possible to think that to tackle the consequences of a change in scientific paradigm with a group of teachers is far beyond their experience. Whereas this was the most fertile core of reflection in term of results, and was found to be one of the most powerful factors inducing teachers to re-examine their behaviour and relations with their pupils.

More specifically, the change from the uni-causal model (referring both to the psychological theories characterised by biological-driven determinism and by the environmental determinism) to the multi-causal model was considered from a theoretical point of view. Particular attention was paid to the problem of "marginal changes" (Caprara, in Bonino, 1994).

The theoretical basis was used as reference point to promote teachers' reflection about the deterministic elements present in many of their professional activities. Teachers understood that their action is often regulated on the basis of rigid predictions, constructed with reference to an understanding of the child characterised by absolutism and founded on a one-way link between past and future (Bonino & Reffieuna, 1999). Theories apparently without any link with the school, like that of Prigogine (1993) (which defines the notion of non-linear system), or that of chaos

(Gleick, 1987; Ruelle, 1991; Noël, 1991; Davies, 1992), encourage reflection on behaviour adopted in planning school activities and assessment of pupils' learning. The Edward Lorenz' "butterfly effect" provides further reflection on the role of chance in learning.

Using theories not directly belonging to the psychological and pedagogic fields might have directed teachers' thought towards dangerous paths, such as probability, chance and chaos, and might have produced a decreased assumption of responsibility, as a consequence of becoming aware of the limits of action.

Constant reference to the Developmental Psychology prevented the teachers from losing themselves, transforming probability into randomness without any rules. Only Developmental Psychology allows one to see the regularity which is behind contingent situations and to see the common elements which are at the basis of individual differences.

The confirmation that training is in fact capable of producing an interaction between theory and operative practice arises from three separate facts, that occurred in different points of time time:
1. The theoretical principles of determinism and probability fascinated the teachers, pushing them towards a deeper understanding and autonomous reading;
2. They often recalled the deterministic and probabilistic models, even during the subsequent process of examining different topics;
3. A really deep cognitive and emotive involvement was achieved, that on the one hand reminded the teachers of their greater responsibility (deriving from the awareness of playing a decisive role in the control of different variables, all influencing children's learning and development) and on the other hand enabled teachers to experience both the satisfaction of their skill and the frustration because of failures due to causes external to school.
    This emotive element, especially strong in the first part of the training course, increased motivation and promoted positive feelings from teachers towards the subsequent activities, confirming how, even in continuing training, cognition and emotion must be balanced, as has already been said Elliott and Calderhead (1993) in connection with the initial training.

4.3. The participants

35 primary school teachers were selected for the training course, on the basis of their voluntary application. They had the following characteristics:
a) university education (degree in psychology or pedagogy);

b) willing to undergo theoretical study and subsequent assessment of the learning achieved.

The sample is not representative of the whole population of elementary school teachers in terms of education (most Italian teachers only possess a secondary school diploma). On the contrary, it does constitute a representative sample of the population of teachers with regard both to age (about 35 years old) and to the number of years worked at school (between 15 and 20 years).

The importance accorded to the teachers' level of education was justified by the research of Cross (1981), according to which individuals' general culture and length of time spent studying are significantly correlated with changes in cognitive processes.

On this basis it was considered that possession of a university degree might facilitate:

□ cognitive processing and the possibility of performing an active role in the construction of learning;

□ specific reflection on the role and relevance of theory in teacher training, which may be easier for those who have already learned theoretical concepts.

Thus a university degree was exspected to promote the ability of these teachers to build their development (Bonino, 1995), filtering the influences addressed to them during the training course. Moreover, possession of a university degree may be another facilitating element, because all these teachers, at least at an implicit level, are involved in a project for personal development, which may meet several obstacles in the school environment. Consequently all of them were actively engaged not only in the development of their pupils but also in their own personal development as school professionals (Stanulis, 1994).

4.4. The role of the mentor in the reflective practice based on the developmental psychology

Engestrom (1996) identifies two interesting elements derived from the life-span approach:

a) Development in some cases may imply the construction of new and consistent configurations of knowledge and behaviour, but at other times it requires the active and conscious destruction of skills already acquired.

b) Development takes place not only bottom-up: it often consists simply of a movement going beyond a boundary thus amplifying the space for action.

c) This process, proceeding through gains and losses, explains how the teacher, despite being an expert in the disciplines that he or she teaches, is vulnerable as a human being (Bronfenbrenner, 1979).

Even if several studies have emphasised adults' psychological need for self-government (Cross, 1976; Knowles, 1989), the tendency to consider teachers as children during continuous training often helps to develop their dependent attitudes. To change this, it is not sufficient to invite them to question themselves or to reflect on their own work; rather it is necessary to involve them actively in the learning process.

That may be achieved if training is constructed on the relationship between the interior world of the teachers and the external appearance of what is proposed. Only this connection enables a reflective process to be achieved. Indeed, a reflective process is founded on a constant relation between:
- the knowledge acquired (of a scientific nature);
- the cognitive functioning (the way in which each person processes knowledge);
- the meta-cognition (the awareness and the control of one's own learning).

The presence of a mentor [1] who leads and supports the teacher in the whole process therefore becomes indispensable.

In our training model, the mentor held the role of mediator between theory and practice, on the one hand, and between university and school, on the other hand. Her intervention had two main goals:
- to demonstrate to the teachers that theory may be directly related to the daily reality of school, and indeed may both provide efficient tools for interpretation and indicate some paths for solution. In this case the intervention of the mentor took place contemporaneously with the intervention of the expert during the phase of the course devoted to transmission. It therefore had the aim of activating the immediate reflection of the teacher, and encouraging a link between previous experience, which the teacher carries with him or her, and new knowledge.
- to show how the data collected through the practical exercises in the classrooms (first discussed at a theoretical level) confirm the usefulness of the theory and lead to a deeper understanding of the phenomena. This phase is of crucial importance, since the teacher at this time achieves change and moves toward a new theoretical model, or abandons it and return to his/her previous behaviour. If the teacher does not gain anything useful from the new theory, and consequently returns to the theories that regulated his/her action previously, not only the status quo has been re-established, but also the old theories have been reinforced and are now more difficult to change.

The mentor's intervention in different phases is justified by the necessity to activate teachers' personal reflections about the didactic practice followed until then in the first phase, and to intervene by recalling attention to forgotten elements, to problematic core contents and to necessary clarifications only in a second phase.

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[1] The role of the mentor, inside this training course, was played by one of the authors: Antonella Reffieuna.

Through these two phases autonomous reflection of the teachers and the externally-induced reflection finally become complementary.

These aims can be achieved because the mentor behaves as follows:
- the mentor has to make explicit the implicit skills and knowledge available to the teacher (Mitchell, 1994). Within the teacher, a process of re-organisation and systematisation in his/her cognitive and emotional patrimony should occur. Through this process, the teacher become able to establish new relationships between phenomena that he/she daily faces and consequently to reach explanations which previously were precluded.
- the mentor must speak the teachers' language, but must raise it to a higher level. That means, on the one hand, valuing the teachers' talk, and, on the other hand, gradually introducing new and more precise concepts and terms.
- the mentor must the team leader, promoter and facilitator of learning (Wilkin, 1992). He/she must start from each individual's history, from the dawning awareness of the level of professional development, from the influence produced by this level of skill on the way in which one relates to others subjects (pupils, colleagues, parents). The mentor provides methodological and operative suggestions aimed at promoting behaviour and «know-how» in the teachers; specifically:
  - critical observation of the different teaching situations;
  - organising observation and analysing the data collection;
  - acquiring awareness of how to conduct teaching activities;
  - stressing difficulties, analysing their possible causes, and identifying the necessary corrections.
- The mentor therefore support the teachers as they reflect on action, in order to allow them to gain self reflective knowledge. He/she thus places himself/herself inside the teachers' proximal developmental zone (Vygotskij, 1930-31) and at the same time allows them to overcome the isolation conditions that may arise where the relationship with the classroom is concerned (Little, 1990; Gratch, 1998).

Because the activity is not at the beginning of the teacher training, but at the level of continuous training, the model of the mentor proposed in this study, just is partially different from those usually reported in the literature (Saunders, Pettinger, Tomlisnson, 1995; Haggerty, 1995). This model raises the problem of identifying the skills that this type of mentor must possess. He/she must have both a direct experience of school and teaching and a wide knowledge of theory (Haggarty, 1995), otherwise he/she cannot promote any change in teachers' personal theories. Moreover, specific knowledge should be available to him/her allowing to underline links between psychological and pedagogical theories. It constitutes then an amplification of the concept of «espoused theories» (Argyris &Schon, 1974: Argyris, 1975, 1976) which goes beyond the relationship between theory and action.

In order to be effective, the mentor's action thus implies establishing a close partnership with the expert who provides the theoretical part of the course. The

relation established between mentor and expert is thus the premise for a planned relationship between theory and practice. If this relation between the subjects is not equal, it there may be a prevalence either of the theoretical or of the operative component, and the balance that is the indispensable condition to promote a real change in the teachers will not be achieved.

5. Results, discussion and conclusion

The methodological path followed in this study, and contents of the course that were selected, allowed the teachers:
- ❑ to gain a knowledge of the whole developmental process in the complexity of its affective, cognitive and social elements;
- ❑ to reflect on the way these elements are interwoven in the child's daily life.

The final evaluation involved 28 teachers out of 35 (7 were absent at the last training meeting due to its co-occurrence with school engagements). This evaluation was done by filling in a specific questionnaire with closed answers (they were constituted of polytomies scored from 1 to 6).

The main results are outlined below:
- ❑ a mean score of 5.1 was attributed to the meetings with predominant theoretical contents, corresponding to an 82% success-rate[2] of lessons;
- ❑ a mean score of 5.6 was given to the material provided for personal study, and in this case the success-rate was 89%;
- ❑ the greatest interest was attributed to the topic of deterministic and probabilistic models (mean score of 5.6, success-rate 89%);
- ❑ a mean score of 5.8 was attributed to stimuli promoting personal reflection, with a success-rate close to the maximum (98%);
- ❑ the three most appreciated elements were: the relationship between psychological theory and teaching practice (23 out of 28 teachers, or 82%), the interaction between theory experts and mentor (21 out of 28, or 75%), the material provided for reflection and individual study (20 out of 28, or 71%).

These results confirm that the theoretical issues are not refused by teachers, when they are allowed to consider theory as a useful tool to intervene more efficiently at the operative level.

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[2] Since the scale of each question ranged from 1 to 6, indicators of lessons success were considered to be scores equal or greater than 4.

In the free comments made by the teachers on the evaluation questionnaire, they stated that their willingness to study and gain a deeper knowledge had increased (21 subjects out of 28, or 75%). Furthermore a high percentage of teachers (22: 79%)said they had , both immediately and after some time, referred to the knowledge acquired in the training course in their classroom, managing to create a better climate. This point, expressed freely by the teachers and not specifically asked for in the questionnaire, may also be confirmed by the data resulting from the analysis of two practical exercises, respectively at the beginning (during October 1996) and almost at the end (during May 1997) of the training course. The two exercises were conducted using «social preference peer nomination»[3], a psychological instrument derived from the Moreno socio-metric test. The procedure adopted to administer the test is not completely «scientific» because not all the necessary cautions were applied (i.e., there was no control group; the questionnaires were administered to the pupils directly by their teachers[4]). Nevertheless, we think that the results obtained from the data

[3] "Social preference peer nomination" is a tool that that enable to investigate social relationships within a group, such as a school classroom (Pastorelli, 1994). It is different from the classical socio-metric test, more addressed to measuring the quality of the relationships within a particular group, since it aims to obtain an objective measure of individuals' behaviours in the group context (Pastorelli, 1994). "Social preference peer nomination" is considered a very good predictor of adjustment and maladjustment during childhood (Caprara, Pastorelli, 1993). There are several different versions of the peer nomination adequate to investigate specific psychological dimensions, such as aggressiveness, pro-social behaviour and emotional instability (Caprara, Laeng, 1988; Caprara, Pastorelli, 1993), moral disengagement (Caprara, Pastorelli, Bandura, 1995) and co-operation (Bonino, Ciairano, 1998).

The version used for this research aimed simply to investigate the popularity that a child has in his/her group or alternatively the rejection to which he/she is subjected. With this goal, each child was asked to give the name of 3 mates (the "forced" choice and not the unlimited was selected the former offers the advantage of greater experimental control through the introduction of the same fixed parameters for all subjects) with whom: he/she would like to study or play (the sum of these scores for each children constitutes the "choices" received) or he/she would not like to study or play (the sum of these scores for each children constitutes the "rejections" received).

Sometimes "social preference peer nomination" is used in parallel with the teachers' nomination of the children belonging to the same classroom. The teachers are asked to judge how much, on the basis of their perception and knowledge of the classroom, a particular child may be considered popular by mates or otherwise may be rejected.

The literature generally suggest delivering the data to an individual external to the classroom, since the dynamics within a group are extremely complex and consequently the presence of an internal researcher, such as the teacher, may lead to inconsistent or at least modified results.

In the present research it was not possible to deliver the data to an external researcher and they were collected directly by the teacher of each classroom; however, we consider the results to be extremely interesting precisely because of the comparison with other studies. In the literature the important role developed by the teachers in the complex process of peer nominations attribution it has already been acknowledged. This role is expressed by the rather high correlation that is generally found between teachers and peers nomination. Moreover, it was underlined that the teachers' evaluations, and consequently the peer nominations that appeared to be linked to the former, may be influenced by the teachers' judgement and expectations about the child as a pupil (Lo Coco, Zappulla, Casiglia, 1994).

[4] "Social preference peer nomination" was used on the children of the teachers attending the training course. The sample is quite large consisting of 714 children, of both sexes, from 7 to 11 years old, attending from the second to the fifth class during scholastic year 1996/97 at public elementary schools in the city of Turin or in its province, in the North-West of Italy (in Italy children begin at the school at

analysis are good indicators of the effectiveness of the training course and of the change promoted in the teachers. The main results are summarised below.

We believe the results obtained from the data analysis are otherwise indicative of the effectiveness of the training course and of the changes that took place in the teachers. A selection of the main results follows:

1. First of all, the comparison (consisting of a series of correlation analyses, Pearson r) between the first and the second waves of data, points up a certain mobility in the process of nomination allotment. This mobility is expressed both by the absence of a correlation between the choices for the first and the second waves, and by the marked decrease from the first to the second data collection of the negative correlation between choices and refusals. These results are particularly interesting because previous research (Caprara, Pastorelli, 1993) revealed the risk of a crystallisation in evaluation and noted that the attitudes of others towards the child may have an extremely negative influence on his/her behaviour, leading to a vicious circle. In our research, the correlation values between the choices of the first and of the second wave is not at all marked (r = .01, n.s.). That means that popular children may be interchangeable, and that popular children may change over time. Moreover, the negative correlation between choices and refusals underwent a net decrease from the first to the second data collection: it decreased from r = -.30 (p>.000 [5]) to r = .02 (n.s.). In the second wave, the children therefore made a less clear distinction between popular and refused mates.

2. Secondly, it is possible to detect a fundamental difference between the two waves: in the first data collection there is a strongly positive correlation between choices for studying or playing on one hand, and between rejecting for studying or playing on the other; this correlation is completely absent in the second data collection. This is a very important result, since it appears to indicate that, while attending the training course, the teachers became more able to evaluate, and also to let other children evaluate, the positive characteristics that each child possesses and that may be quite different in the fields of studying and playing. The attitude of the teachers may be changed and they may be at less risk (to which referred LoCoco, Zappulla, Casiglia, 1994) promoting in their pupils a popularity evaluation carried out only on the basis of scholastic success in learning. Our research does not determine precisely which factors may have influenced this complex process. What we do know and can affirm is that, between the first and

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the age of six but children in the first classes were not included in this study because it might easily not be possible for them to fill on the questionnaire without the teachers' help, at least during the first data collection at the beginning of the year).

[5] In general, to establish whether a statistical analysis has d significant results, a value of probabilityis considered .05 (expressed by the notation: p<.05). In the present study it was decided to report the exact probability value associated with a certain value of the correlation index only when it was below .05; otherwise correlation values to which is a probability above .05 associated are indicated as not significant (n.s.).

the second data collection (i.e. at the beginning and at the end of our training course) the children became more willing to determine the positive and the negative characteristics of their mates, differentiating between the dimensions of study and play. In fact, the correlation between choices for studying and for playing decreased from $r = .62$ (p>.000) to $r = -.04$ (n.s.) and that between rejection for studying and playing , also it quite high for the first wave ($r = .73$, p>.000) actually disappeared in the second test ($r = .008$, n.s.). We think that is a crucial point since a greater ability to individuate the positive aspects in peer's behaviour might be the first step in the promotion of his/her personal self-efficacy with possible positive influences also in other dimension.

The results of peer nomination were communicated to the teachers only after they had completed their evaluation questionnaire. Thus it is very impressive that the findings from the practical exercises combine as well with the teachers' freely-expressed comments on the evaluation questionnaire.

Finally, the real change achieved in the teachers' behaviour, based on greater mastery of their profession, and the new skill transferred onto own working context, are confirmed by the increasing sense of personal self-efficacy that teachers experienced. A greater ability to justify their choices and behaviour dealing with colleagues, the head of the school and also the parents, in general a more authoritative behaviour, was reported by all the teachers present at the evaluation. Referring to the development of their greater confidence, the teachers themselves remarked on their the ability to call on theories not directly linked to their daily context of action, and which may function as a scientific guarantee of their thoughts.

This result was not intentionally sought by the authors and not foreseen by the project of the training course, but it is highly indicative of the depth of the course's influence on the teachers.

We may therefore say that the proposed intervention model and the contents of the course were effective. In particular the starting hypothesis, that referring to Developmental Psychology, since it involves the children to whom the teacher relates every day, may promote the reflection process leading to a behaviour change, was confirmed.

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