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Challenges of The Interactive Methods Based on the Socio – Constructivist Theory in Teachers' Training

Lavinia NITULESCU[1], Ileana ROTARU[2]

Abstract

The paper aims at highlighting the positive effect of applying socio-constructivist theory within the psycho-pedagogic study programmes. Social constructivism draws together cognitive processes with social interactions taking place on the occasion of these interactions, which requires the use of specific methodologies, based on interactive learning and learning by co-operation. The main reaserch sample consists of 212 subjects – students enrolled in the programme of psycho-pedagogic studies, in an experimental pretest/posttest plan with equivalent groups. Among the psycho-pedagogic research methods we used two methods which correspond to the experimental requirements: the method of the written questionnaire inquiry and the pedagogic test. The results were processed by the statistic-mathematical methods: tables of synthetic results, determining the central trend, identifying the correlation. Also, the focus group method was used to determine the trainers' perception within the training programme. In the present research we used this method in the posttest phase, with a sample of 20 university teachers (professors, deputy professors, lecturers, assistant lecturers) who applied interactive training methods, monitoring mainly the appreciation of the usefulness of interactive methods, by highlighting the effects of their application. As a general conclusion of our reaserch, the interactive methodological intervention (based on the theory of social constructivism) led to the improvement of the activity within the programme of psycho-pedagogic studies. The experiment conducted reveals the modifications due to the use of interactive methods in the didactic activity afferent to teachers' initial training, and the data collected confirm the expected cognitive, practical-applied and inter-relational progress.

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Introduction. Learning as Interaction

One of the fundamental features of education and learning is their interaction character. As Professor I. Cerghit put it, "we find in man's nature (and especially in the nature of today's generation) the inner need for establishing and maintaining a profusion of exchanges of information and ideas, impressions and opinions, for practising the communication with the others, which constitutes a good opportunity to build socio-affective relationships, of mutual comprehension and co-operation" (2006: 138). The essence of interpersonal relations is interaction. The interactional character of the educational process is highlighted by a true network of interactions: on the one hand, *trainers* and *trainees* interact, and between their interactions interdependencies and mutual conditionings are established, and on the other hand the *trainees* interact among themselves, they co-operate with one another, becoming active and responsible participants in their own training, and thus subjects of education (Ionescu & Bocoș, 2009: 199) and a high quality of education due to their reliationship (O'Conner et. al, 2011: 120) The use of the acquisitions of socio-constructivist theory in the process of teachers' training requires the application of certain interactive didactic methodologies, of modern conception wand with high efficiency. In the period of the academic year 2011-2012, the interactive intervention proposed and achieved with the programmes of pedagogic studies was focused on the *methodological* and *practical components* of training (in fact, indissolubly connected). The methodological component involves the preponderance, within courses and applications, of methods based on the use and development of relationings within the group, whereas the second supposes training and practising praxiologic competencies within the stages of pedagogic practice.

The entire strategy relies on the basic elements of learning by collaboration: positive interdependency, promotion of leaning by direct interaction, individual responsibility, interpersonal and small group skills, group processing (Richardson, 1997), common leadership, members' heterogeneous *character, teacher's observer role (he can intervene whenever need be); on the two guiding principles of critical thinking* formulated by Donna Ogle (1992: 26): practising thinking methods as frequently as possible; regular use and focus upon several strategies of useful thinking, easily transferable from one field to another and on the variations on the *issue of co-operative structures* (Aronson, 1980; Johnson & Johnson; Holubec, 1993; Kagan, 1992).

Theories of Interactive Learning. Socio-Constructivist Perspective

As far back as the beginning of the 20th century, researchers forwarded models of the contribution of social interaction to cognitive development. Mead (1934) was the first theoretician to acknowledge the origins of cognitive development in little children's social interactions. Mead argues that before the suckling develops symbolic conceptualisation, he engages in a "gesture" conversation with his mother or with his caretaker. These first dialogues become the bases of knowledge. Several major theories have imposed themselves about the way in which social interactions become relevant for learning in heterogeneous classes, contributing to cognitive development, and we consider relevant to present them briefly.

Piaget's development theory. Piaget elaborated a functional model of intelligence, characterising his theoretic work as a "genetic epistemology" (Piaget, 1970), sketched on the biologic and psychological fund. Several aspects are fundamental in Piaget's theory: *stages of child's development, field of interactions where the subject constructs his knowledge* and *environment adaptation process.* Focusing his research around the main concept of cognitive structure (mental scheme or *map*), Piaget proposed a model containing four cognitive structures or development structures: sensorial, pre-operational, concrete operations, formal operations. Piaget explains the passage from one stage of cognitive development to the next by the existence of adaptive misbalances, which oblige the individual to use all resources of *assimilation* (interpretation of an event in the context of an existing cognitive structure) and *accommodation* (adjustment of cognitive structure in order to give sense to the environment), in view of *adaptation*. For Piaget, equilibration and development are practically synonym, as each perturbation of a balanced cognitive system gives birth to a better form of equilibration. Intellectual capacity is qualitatively different at different ages and children need interaction with the environment in order to gain intellectual competence. Some of the debates in the educational sciences about the role of the individual and the social factors present Piaget in contrast with Vigotsky on the matter of the primacy of the individual cognitive process (DeVries, 1997)

Vygotsky and social knowledge. Vygotsky's learning model affirms that social interactions are primary functions of cognitive development. A fundamental aspect of this theory is represented by the fact that biologic and cultural development cannot appear separately, isolated. Vygotsky (1978) considered that social learning precedes cognitive development (ability to think and reason), stating: "each function in the child's cultural development appears twice: first on the social level and then on the individual level; first among people (inter-psychological) and then in the inner child (intra-psychological)". This equally applies to the voluntary attention, logic memory and concepts formation. Unlike Piaget, Vygotsky thought that cognitive development is a lifelong process, which starts at birth and continues until death. Consequently, based on the idea that learning is dependent on social

interactions and cognitive development is the result of social learning, Vygotsky concluded that learning takes place in what he called the Proximal Development Zone (PDZ). This signifies the gap between what an individual already knows and what he can learn with help and guidance (Crawford, 1996). As a pioneer, Vygotsky anticipated the shifts in the social and educational paradigms at the born of network society. Both Piaget and Vygotsky offered vast elaborated theories, which documented the field of cognitive development.

Theory of modelling and social learning. The modelling theory developed by Bandura points out the central role of *modelling* (learning by observing others) in the development of personality, based on studies on interactive processes in psychotherapy and family patterns triggering aggressiveness in children. According to Opre (2002: 12), these studies were concretised in two works: "Adolescent Aggression" (1959) and "Social learning and personality development" (1975). In the book entitled "Social foundations of thought and action: A social cognitive theory" (1986), Bandura attempted to clarify aspects of human capacities in relation with the development of personality. His most recent works are focused on human motivation and implications of self- efficacy (personal competence) on the sentiment of physical and psychic comfort (well being). The modelling theory developed by Bandura points out especially the important *roles* played by the "*symbolic processes* which self-adjust in human psychological functioning" (*apud* Negreț - Dobridor and Pânișoară, 2005: 68). According to Bandura, all learning phenomena resulted from direct experiences may occur due to the analysis of other people's behaviour and of its consequences for the analyser. Bandura proves that *the behavioural exchanges produced by instrumental conditioning, classic conditioning, are cognitively mediated*. The phenomenon of modelling implies in fact four interconnected sub-processes: attention processes (determination of modelling stimuli that will be observed and of those who will be ignored), the retention processes (repetitions stabilising and strengthening the acquired answers), motion reproduction processes (use of symbolic representations of behavioural models), motivational and strengthening processes (responsible for behavioural matching/adjustment).

The theory of socio-cognitive conflict as source of cognitive progress. Developed by a group of psychologists known as "The Geneva School" (Doise & Mugny, 1998) who study the way in which social interactions affect cognitive development, the theory uses as theoretic basis Jean Piaget's genetic epistemology and its postulates regarding assimilation, accommodation and individual cognitive development, adding the social, cultural and interactive dimension to Piaget's model. Considering the interpersonal conflict insufficient for determining cognitive development, they search for the source of this development in interpersonal confrontations (Momanu, 1998: 220). In accordance with the socio-cognitive model, social interactions will generate misbalances in the subjects' existing knowledge schemes, which may be solved by operational co-ordinations (interpersonal and

intrapersonal), which require advanced levels of understanding. The main thesis presented by Doise and Mugny is that interaction with others and sharing personal visions about reality and environment with others lead to individual cognitive development. The latter, in its turn, leads to interactions within the group of learning by collaboration, which trigger future cognitive developments. The initial conflicting opinions in the group (socio-cognitive conflict) result in enhanced learning for the individuals in the group. In essence, they try to solve ideological conflicts having as result individual cognitive progress of intelligence and communication (David, 2002: 178). Stressing the social origins of behaviour and the importance of cognitive processes in all aspects of human functioning, the social-cognitive theory has several characteristics which differentiates it by comparison with other approaches: shaping the individual as action agent; overbidding behaviour's social origins; highlighting the importance of cognitive processes in personality's development and functioning. In order to explain the social nature of cognitive development, Doise and Mugny (1998) introduce, along with the concept of *socio-cognitive conflict,* that of *social marking*. The socio-cognitive conflict refers to the divergences of opinions and solutions among individuals, occurred during social interaction, whereas social marking allows "the study of connections between the principles of social adjustment and the principles of cognitive adjustment" (1998: 44).

The constructivist theory. The major theme of the constructivist theory is that "learning is an active process in which those who learn build new ideas or concepts based on their present or past knowledge" (Kearsley, 1994). Each acquisition relies on present development, trainers provide new information which are interlaced with trainees' existing information. Trainees select and transform the supplied information and are encouraged to discover new concepts, to build them on previous achievements. Knowledge represents a mental constructions always subjected to development. Constructivism is the theory of knowledge, but also of learning, with effects in the pedagogic plane, forwarding a theoretical and practical solving of "how", "why" and "what" is known and learned, "in what conditions", "how it evolves" (Elgedawy, 2001). Three types of constructivism are usable in learning (Joița, 2009): *radical constructivism* (knowledge as subjective individual mode of concept construction), *cognitive constructivism* (knowledge construction is based on information interiorisation) and *social constructivism* (knowledge is a product of group dialoguing mode). According to social constructivism, the model of knowledge / learning by co-operation and collaboration completes constructivist learning, by involving the social side, the appeal to the class and group constituting "one of the stages of achieving the proposed construction" (Joița, 2006: 179). As the construction resulted from collaborative learning is an active one, it is necessary to practise the confrontation of ideas, which will transform individual knowledge (Jonassen, 2000).

The socio-constructivist theory. This perspective takes into consideration the importance of socialisation, connecting cognitive processes with social interactions and confrontations of ideas which take place on the occasion of these interactions, equally valuing learning and socialisation (Bocoș, 2002: 42). The conception on individuals' cognitive development is interactional and constructivist and education's characteristics from the socio-constructivist perspective are the following: a) conceiving schools under the form of learning communities (Brown & Campione, 1994), where learning responsibility is individual, but is achieved in practice by participating in group task solving, by interaction, negotiation and collaboration; b) evaluation takes the form of dynamic evaluation, taking into account social influence, unlike traditional evaluation which attempts to reduce to a minimum, by its practices, the social contribution to the determination of learning products; c) school is sensitive to pupils' and students' cultural differences (a school for all trainees).

In the effort of learning significant optimisation, Windschitl (2002: 137) recommends the observance of the specific traits of the activity within a constructive class: a) teachers provoke students' ideas and experiences related to key topics and then model the training situations which help them to elaborate or restructure their knowledge; b) students are frequently offered opportunities to get involved in complex, important activities; c) teachers offer students a diversity of information sources, as well as the technical and conceptual apparatus necessary to the mediation of the learning process; d) students work in collaboration and are supported to engage in motivational discussions; e) teachers explain participants their own system of thinking and encourage students to do the same, by dialogue, in writing, by drawings or other representation methods; f) students are regularly asked to apply their knowledge to different and authentic contexts, to explain ideas, to interpret texts, to offer phenomena prognoses and to build arguments founded on evidence, rather than to focus exclusively on the assimilation of the predetermined *correct answer*; g) teachers encourage independent thinking and reflection in the context of the above conditions; h) teachers use a multitude of evaluation strategies for understanding how students' ideas are developed, in order to supply a reaction both about the process and about the results of their thinking.

The learning model becomes thus a socio-constructivist model, pointing out specific principles related to the development of thinking in the context of the collaboration with the others (colleagues and teacher). This perspective on knowledge and learning may be synthesised in the following postulates (Ouellet and Guilbert, *apud* Joița, 2006: 180): a) constructivism supposes personal reflection, critic and analytic thinking, meta-cognition, searching the variants for solving situations, but trainees need support, guidance, orientation, encouragement by

relationing with the trainer and the group; b) collaboration among trainees is fundamental in the class, in the group, as participants act in a researching community and it is only natural to encounter contrary opinions, varied arguments, affirmation of other persons' critic judgement, need to verbalise personal ideas and to listen to colleagues' ideas. And the processes of group reflection are progressively interiorised by each trainee; c) the trainee feels the need to formulate and ask open questions, to formulate hypotheses and critic reflections, or the group and trainer put them in such situations of exercising, pointing out and using errors as points of start and orientation in research; d) In the continuous and final evaluation, the group and the trainer thus appreciate especially processes, procedures, constructed solutions, attitudes, meta-cognition level rather than immediate concrete results.

From these general socio-constructivist principles rules are derived, meant to facilitate their observance: building problems that use elements of critic thinking and challenge the manifestation of responsibility in learning; presenting the problem in a context that has a significance for the trainee, taking into account his previous experience; guiding the participants by asking questions and formulating stimulating remarks; trainees' support for the use of varied cognitive strategies and of different information resources, guidance in the use and awareness of value assessment, of positive and negative aspects in the constructed processes and solutions.

Methodological Aspects of Interactive Learning

Lectures and discussions are no longer part of the methods of training social competencies, and we remark the obvious effort to modernise methods, by distancing from methods based on memorising and repetition, in the favour of the interactive ones. Those methods are promoted which "lead in an organised manner, either in the pupils' group-class, in small groups or in pairs, to the construction of interactivity, which encourages the free inter-exchange of knowledge, of ideas and experiences, the confrontation of opinions and arguments in view of reaching in common the construction of new knowledge, new clarifications and solutions to problems" (Cerghit, 2006: 75). They might be also considered in the context of the action reaserch theory where the students seeks the knowledge within the educational process (Gustavsen, 2008), critically and independent. Educational strategies appear as *interactive processes*, developing influencing mechanism which highlight the social characteristics of the educational environment: ideology and reference value systems, objectives and norms, expected behavioural models, organisation of educational institutions (Neculau, 2004: 11). The educational context represents a true *interactive studio*, where constitutive elements stimulate the involvement in a participation dynamics (Ilica, 2009: 193). As Neculau put it,

"the passage to interaction" stresses the development of communication competency, the acquisition of a "culture of satisfactory interaction" (Neculau, 2004: 43). The roles of teacher and pupil are essential in the achievement of social interaction, both being equally engaged in knowledge reaching (Tinzman, *apud* Joița, 2006: 184): a) the teacher is the facilitator who creates the context for affirmation, it is the teacher who structures the problem, offers the means, organises the activity for everyone, formulates tasks, encourages diversity, suggests perspectives; he is the mediator among pupils different in terms of information, experience, comprehension level, interpretation, communication, he urges the formulation of questions and hypothesise, draws the attention on the strengths and weaknesses in critic appreciations. There are studies on teacher's style of classroom management from coercion to likability (Alderman & Green, 2011: 40). In spite of the style that he adopted in raising the efectivness of classroom management, the teacher however does not impose, does not conduct analyses, does not replace direct and interactive knowledge by exposition, does not impose solutions, but may suggest arguments, alternatives and procedures. He has the role of a guide or coach in this context, performs discussion monitoring, uses feedback, redirects effort etc. Mayer (2004: 14) proposes learners should be "cognitively active" during learning and that instructors use "guided practice."; b) the pupil affirms himself as active participant and collaborator in defining tasks and manners of group solving, aims at progress, appreciates the answers of the others, completes, criticises, rephrases, proposes interpretations and solutions, gives examples, compares, syntheses, uses criteria of analysis and comparison, proceeds to self-evaluation, provides prospects on learning continuation etc. c) Nevertheless, as not all interactions have significant implications on individual cognitive development, and the effects of social interaction upon cognitive restructuring of a participant in the activity are not in direct relation with the level of collective products (Doise and Mugny, 1978), for the promotion of social interactions determined by cognitive progress the trainers must acquire certain abilities: assisting trainees to progress from inexact ideas to scientifically grounded conceptions; enhancing awareness of the idea that participants trigger the learning situation; clear definition of the purposes for trainees and the comprehension of the manner in which they could progress by reaching them; the use of didactic strategies which involves the challenge and development of ideas; ensuring the opportunities for trainees to use the new acquisitions in a series of contexts; ensuring a climate meant to encourage participants to debate and use their ideas; the diversity of the interactive methods at teachers' disposal may be very high, and their grouping criteria (in an attempt to characterise them and to point out their applicability) are also very varied in accordance with the analysis angle. There are also, voices that describe constructivist teaching methods as"unguided methods of instruction" (Kirschner *et al.*, 2006).

Starting from the idea of an active-interactive *methodological continuum*, Pânișoară (2008: 307-309), proposes the functional-actional approach of classifying educational methods. Describing, in the proposed classification, the main set objective, one pole of continuum is represented by the active dimension of methods, and the other pole refers to the interactive dimension (the goal to reach), and the author forwards the following categories of methods: methods focused on phenomenon analysis, idea production and problem solving; methods focused on reflection, observation and action; methods based on the use and development of relationing within the group. As the functional interdependence between the group interactive methods and techniques is well known, the approach of interactive methods starts from the following perspective: *specific debates will intensify the development of inter-relationing among participants, leading then to problem solving.* We suggest the following classification of interactive methods and techniques: a) Debate methods, that may be: *focused on co-operation* (method of small group learning - Student Team Achievement Divisions (STAD); the jigsaw method; the Phillips 6-6 reunion), and *focused on competition* (constructive controversy, method of teams' tournament - Teams Games Tournements - TGT, differentiated votes); b) Methods of inter-relationing development, which may be: *focused on intra-group interactions* (learning together; fish tank) or *focused on inter-group interactions* (ice breaking techniques, rotative communication); c) Methods of problem solving, such as: *focused on phenomenon analysis* (analysis of interactive decision segments - Interactive Decision Analysis Aids - AIDA, SWOT analysis: Strengths – Weaknesses – Opportunities – Threats, Group of professional enhancement– GAP; the cube method), or *focused on the production of creative ideas* (brainstorming, PIPS, synectics, Frisco method).

The Research Design

The research aims at identifying the modalities by which the lectures and applied activities may be organised more efficiently, starting from the idea that psycho-pedagogic training represents an indispensable requirement of didactic profession. We opted for the dynamics of a development experiment, realised by research-action. A pedagogic experiment relies on the existence of one (or several) hypotheses, aims at modifying a phenomenon or process, as one rigorously observes and measures the effects of this modification. In the present paper, in order to reach the main goal of our research, i.e. *improvement of the activity within the programmes of psycho-pedagogic studies,* we started from the supposition that this may become possible if the present official programme of improvement would be transposed into an interactive programme of teachers' training.

Hypotheses

The general hypothesis to be verified is: *The interactive methodological intervention (based on the theory of social constructivism) will lead to the improvement of the activity within the programme of psycho-pedagogic studies.* Particular specific hypotheses, after verification and validation / invalidation, allow the verification and validation / invalidation of the general hypothesis from which they derive. The particular hypotheses considered by the present research are the following:

Hypothesis 1: *If the organisation of activities within the programmes of psychopedagogic training systematically considers the creation of contexts favourable to interactivity stimulation in the groups of trainees, it is possible to increase the students' level of cognitive acquisitions.*

Hypothesis 2: *In the context of the frequent use of interactive methods, in the process teachers' initial training, we witness an increase in the opportunities for the development of future teachers' practical applied competencies.*

Hypothesis 3: *Students' participation in the activities organised in an interactive manner results in the visible intensification of interpersonal relations, contributing to the increase in the cohesion of the group where they carry out their activity*.

Rigorous observation and measurement of the effects produced by the experimental action suppose the setting of criteria and indicators based on which the validation of the research hypotheses will take place. Specifying the fact that a criterion represents the general analysis category, whereas an indicator considers a concrete feature or behaviour, the present research took into account three criteria (cognitive acquisitions, practical-applied competencies, inter-relational progress), their analysis monitoring several indicators. The cognitive acquisitions are analysed using the following indicators: comprehension enhancement; creative-reflexive thinking; selective analysis of ideas; interpretation capacity, acquisition of new information; knowledge systematisation. The practical-applied competencies considered are: the skill of using interactive methods; ICT skills; capacity of organising materials and ideas; capacity to select methods in accordance with the set goals and contents; ability to engage students in stimulating situations of learning by co-operation; capacity to set stimulating tasks for individual study; capacity to use adequate assessment methods. The relationings within the group are analysed according to the following indicators: increased socialisation; constructive competition; mutual assistance; group cohesion; communication with partners; trainer's roles; consensus reaching; co-operation acts.

The sample

The sample was made of 212 subjects – students enrolled in the programme of psycho-pedagogic studies, level I and II. We chose *an experimental pretest / posttest plan with equivalent groups.* Thus, a number of 156 subjects (divided into five groups of study) were included in the control sample whereas another 156 subjects were included in the experimental group (comprising the same number of groups), using the technique of equivalent samples. The groups' equivalence was realised by pair control – each subject from the experimental group was assigned a subject with similar characteristics in the control group. The equivalence between the control group and the experimental group was ensured by using the criteria constituted by the level of the study programme and the specialisation attended.

Methods

The purpose of the research required the use of a set of methods aimed at data collecting, processing and presentation. Among the psycho-pedagogic research methods we chose two methods which correspond to the requirements of an *experimental research: the method of the written questionnaire inquiry and the pedagogic test.* The statistic-mathematical processing required the use of the following modalities: *tables of synthetic results, determining the central trend, identifying the correlation.*

The method of the written questionnaire inquiry. The students participating in the psycho-pedagogic training are educated and competent persons, able to appreciate their own transformation and progress (cognitive, attitude-behavioural, practical-applied), but also those of the group, acquired following the participation in the didactic activities (organised in traditional and interactive manner) afferent to training. The items of the questionnaire aimed at identifying the cognitive, practical-applied and inter-relational progress acquired by the trainees due to their participation in the activity of lifelong training.

The pedagogic test. In order to identify the level of knowledge acquired by the students as a result of training, a pedagogic test was applied. The test items are focused on issues from the sphere of didactic methodology in general, and of the interactive methodology, in particular.

The focus group method was used with the purpose of knowing the state of things as regards the perception of those who teach the lectures and practical activities within the training programme. Although the focus group (in its capacity of method of qualitative research) intervenes in the phase of problem identification, the information obtained from a qualitative research being used as starting point for a quantitative one, in the present research we opted for the use

of this method in the posttest phase. We organised a focus group with a sample of 20 university teachers (professors, deputy professors, lecturers, assistant lecturers) who applied interactive training methods, monitoring mainly the appreciation of the usefulness of interactive methods, by highlighting the effects of their application.

The research results were subjected to pretest-posttest comparisons, as follows: comparisons between the control group and experimental group in each stage, and then comparisons between the pretest and posttest phase for each separate group. The descriptive processings (based on the *average calculus*, in the case of items that investigate a high number of aspects, and of *frequency*, for the items that investigate one single aspect) were followed by the realisation of the adequate inferential processings. For the comparisons realised between the control group (Gc) and the experimental group (Ge) we used *the Mann-Withney U test* (for the comparison of indicators corresponding to each criterion – in the case of items investigating several indicators-, the distributions of results having an asymmetrical shape, which makes it necessary to use of a non-parametric test); the χ^2 *test* (for comparing the frequencies of answers for the items investigating one single indicator). For the pretest-posttest comparisons for each group, we used the *t Student test* (because the conditions for using parametric tests were fulfilled).

The stages of the experiment

The research supposed the passing through the following stages: a) *Pretesting.* It was performed by the application of the questionnaire and of the pedagogic test both to the subjects from the control group and the subjects from the experimental group. The subjects from the control group attended the subjecmatters of the psycho-pedagogic training programme organised in traditional manner, using methods such as: lectures, role play, conversation, case study, debate, project elaboration etc.; b) *Experimental treatment.* The subjects from the experimental group will attend the study programme, focused on methods such as: fish tank technique, AIDA (analysis of interactive division segments), GAP, opinion sharing, STAD, Frisco method, jigsaw, ideas assault, differential votes, constructive controversy; c) *Posttesting.* The activity took place in a differentiated manner, in a traditional manner (in control groups) and in an interactive manner (in experimental groups). We applied the same tools (questionnaire and pedagogic test) to the subjects from the two samples (control and experimental), with the purpose of identifying the effects of the interactive utilised methods. In order to support the quantitative data obtained by the questionnaire and the pedagogic test, in the posttest we introduced a qualitative method: the focus group.

Results

It consisted in the comparison of the results between the experimental and the control sample in the pretest and posttest phases (inter-group comparisons) and the comparison of the results within the same sample related to the moments of the pre-test and post-test (intra-group comparisons).

Consequently, as regards the *level of cognitive development*, we found the following:

- In the pretest phase, at the knowledge test, the differences between the experimental and the control group are not statistically significant;
- In the posttest phase, between the experimental and the control groups we remark the existence of significant differences (of approximately 1 point) for the indicators *creative-reflexive thinking* and the *interpretation capacity*;
- For the control group, the results of the docimologic test are better in the posttest phase compared to the pretest phase, the inference tests revealing significant differences for the *acquisition of new information* indicator (t=-7.896 to p=.000);
- For the experimental group, the results of the docimologic test are significantly better in the posttest phase for all the assessed aspects: *interpretation capacity* (t=-10,254 la p=.000), *selective analysis of ideas* (t=-8.430 to p=.000), *acquisition of new information* (t=-9.946 to p=.000), *creative and reflexive thinking* (t=-4.841 to p=.000), *information systematisation* (t=-6.117 to p=.000), *comprehension enhancement* (t=-9.138 to p=.000).

For a better illustration of the results on *cognitive achievements,* there is the statistic data resulted due to the use of the interactive methods (*Table 1*):

Table 1. Cognitive achievements

	interpretation capacity	selective analysis of ideas	acquisition of new information	creative and reflexive thinking	information systematisation	comprehension enhancement
Medium values for the progresses due to the interactive methods						
Gc pre-test	3,77	1,80	3,47	**2,08**	1,60	1,25
Ge post-test	3,60	1,93	4,30	1,71	1,25	1,85
Gc pre-test	3,63	1,92	3,80	1,87	1,38	1,25
Ge post-test	4,71	2,55	4,98	2,51	2,28	2,25
The results of the inferential processings for the experimental group						
T test	-10,254	-8,430	-9,946	-4,841	-6,117	-9,138
P	.000	.000	.000	.000	.000	.000
r	0, 892 - strong connection					

The analysis of results as regards the *practical-applied capacities* revealed several significant aspects:

- In the pretest phase, the level of the practical capacities listed in the questionnaire is relatively similar in the case of the two groups (experimental and control group);

- In the posttest phase, the inferential analyses indicate significant differences between the experimental and the control group for the following indicators of practical-applied capacities' development: *engagement of students in stimulating situations of learning by co-operation* (p=.050), *of using interactive methods* (p=.035), *of using ICT,* (p=.014) and of *establishing stimulating tasks of individual study* (pâ.027);

- In the case of the control group, the values recorded for the appreciation of practical-applied competencies do not exhibit significant differences from the statistic perspective, except the *capacity of using ICT* (t=-2,967 to p=.003);

- In the case of the experimental group, the trainees consider the following capacities as significantly more developed in the posttest phase: *ICT use* (t=-1.991 to p=.048) and *organising materials and ideas* (t=2.567 to p= .021);

- In the pretest phase, using the χ^2 test ($\chi^2 = 0.200$ to p=.968), we found that the *attitude towards learning* is not influenced by the group to which they belong (experimental or control group); in posttest we obtained square $\chi^2= 25.787$ to p=.000, showing that participants' attitude towards training is significantly modified in a positive sense in the case of the positive group.

The homogeneity of values between the two groups in the pretest stage guarantees the fact that the results obtained in the posttest phase are relevant, the differences found are the result of the experimental intervention. Thus:

- The very frequent use of interactive methods triggers the obtaining of progress from the cognitive and practical-applied perspective, fact supported by the *intensity of the connections between the frequency of using interactive methods and cognitive progress*: (r = 0.892 – powerful connection) *and practical-applied* (r = 0. 992 – determinist connection) found in the case of the experimental sample in the posttest phase;

- In the case of the control sample, in posttest, the value of indices of correlation between the reduced frequency of using interactive methods and the level of cognitive progress (r = - 0.065 – weak connection) and practical-applied (r = - 0.472 – medium intensity connection) reveals the fact that the *reduced frequency of the interactive methods does not result in reaching significant progress* for the above domains;

- in pretest, the average values obtained show that the subjects from the experimental group consider to a higher extent that the interactive methods are useful (m=3.82), compared to the control group (m=3.78). As we obtained U=1768.500 to p=.856, the difference found between the two groups *is not significant*, the subjects agreeing approximately to the same extent with the utility of interactive methods; following the intervention, we found for the experimental group a significantly higher average (m=3.61) compared to the control group (m=3.08), the value U=1577.000 to p=.047 confirming the fact that the subjects from the experimental group consider to a significantly higher extent that interactive methods are useful for the success of training.

Table 2. Practical-applied capacities

	capacity to select methods in accordance with the set goals and contents	ability to engage students in stimulating situations of learning by co-operation	the skill of using interactive methods	ICT skills	capacity of organising materials and ideas	capacity to set stimulating tasks for individual study	capacity to use adequate assessment methods
Medium values for the progresses due to the interactive methods							
Gc pre-test	3,92	4,32	4,28	4,48	4,27	4,28	4,00
Ge post-test	3,98	4,38	4,10	3,81	4,35	4,03	4,06
Gc pre-test	4,12	4,52	4,28	4,16	4,18	4,23	
Ge post-test	3,88	4,55	4,31	4,45	4,38	4,21	
The results of the inferential processings for the experimental group							
T test				1,991	-2,567		
P				.000	.000		
R	0, 992 - determinist connection						

Trainees' participation in the activities organised in an interactive manner resulted in the intensifying of *interpersonal relations*, contributing to the increase of group cohesion, as we found the following:

- in the pretest phase, the *differences between the control and experimental group are not statistically significant*;
- *in the posttest phase, the differences between the control and experimental group are statistically significant,* for: *mutual assistance* (p=.008), *com-*

munication with partners (p=.016), *consensus reaching* (p=.030), *tolerance to different opinions* (p=.014), *co-operation acts* (p=.002);

- in the case of the control group, *the level of relationing within the group is not significantly modified* in the posttest stage, compared with the pretest stage;

- in the case of the experimental sample, the *differences are significant between pretest and posttest* for the following indicators of relationing among participants: *constructive competition* (t=-3.124 to p=.001), and *increased socialisation* (t=-2.451 to p=.023);

- in the posttest phase, the students participating in the training activities organised in an interactive manner appreciated a very high level of the group cohesion (55.86%), due to the high frequency of using interactive methods, fact proved by the *existence of a relatively determinist (functional) connection between the frequency of using interactive methods and the level of group cohesion* (r = 0. 996);

- the group cohesion is appreciated as being medium in the control sample (55.86%), the low frequency of interactive methods failing to lead to the cohesion of the group members (r = 0,056) in the posttest;

- in the posttest stage, the subjects in the experimental group obtained significantly better results, due to the teacher's / trainer's role modification, which significantly contributed to the stimulation of interactions within the group: a) *the roles of mediator/animator and of colleague / partner preponderantly assumed by the trainers from the experimental samples decisively contribute to the stimulation and intensification of interactions within the group*, the interpretation of the value of correlation indices between the roles of the trainer and stimulation of interactions within the group (r = 0.987 for mediator/animator and r = 0.931 for colleague / partner) pointing out the existence of certain relatively determinist (functional) connections between the two variables, whereas the role of professor/educator, assumed occasionally, is not able to trigger the participants' interaction (r = 0.390 – weak connection); b) in the case of the control sample, the connections of medium intensity between the trainer's contribution to the stimulation of interaction and his roles of mediator/animator (r = 0.565), of colleague / partner (0.665) and of professor / educator (r = 0.592) reveal the fact that the *roles assumed by the trainers from the control sample do not contribute significantly to the intensification of interactions within the group.*

Table 3. Interpersonal relations

Medium values for the progresses due to the interactive methods						
	constructive competition	mutual assistance	increased socialisation	communication with partners	consensus reaching	co-operation acts
Gc pre-test	4,27	4,37	3,93	4,15	4,13	4,63
Ge post-test	4,18	4,16	3,63	4,03	4,13	3,86
Gc pre-test	3,90	4,45	3,78	4,18	4,23	4,42
Ge post-test	4,31	4,40	3,96	4,33	4,35	4,35
The results of the inferential processings for the experimental group						
T test	-2,055	-4,413	-2,816	-2,071	-2,407	-3,404
P	.000	.000	.000	.000	.000	.000
R	0, 996 - determinist connection					

The progress recorded by the students participating in the programme of psycho-pedagogic studies organised in an interactive manner is also confirmed by the qualitative analysis of the results of the focus group attended by the teachers who taught during the training. The participants in the focus group identified the following effects of the use of interactive methods: a) *Cognitive acquisitions:* practising thinking strategies, stimulation of creativity and imagination, thorough comprehension of concepts, valuing personal experiences, elaboration of reasonings; b) *Practical - applied competencies:* the practical use of acquired acquisitions, practising the competencies necessary to the didactic profession, the use of benefits of co-operation in individual work, possibility of using interactivity in numerous educational contexts, effective application of interactive methods in the educational practice; c) *Inter-relational progress:* increased inter-relationing and socialisation, manifestation of interpersonal processes afferent to team work, provocation and solving of constructive conflicts, creation of a climate favourable to learning, consensus reaching.

Conclusions

From the comparative analysis of the results of the control and experimental group, it results that the level of cognitive-applied acquisitions of the students who participated in the interactive module is clearly superior to that found in the case of the control group. We may affirm thus that the participants who benefited from the intervention have a solid level of theoretical and practical training, exhibiting a net advantage following training. We appreciate that this effect is the results of applying certain interactive teaching-learning methods during the intervention. These methods, beside the fact that they are more efficient compared to the traditional ones, have a more poignant attractiveness for students, which

trigger a high interest for training. The level of interrelations is maintained at high levels in the experimental group, the activities carried on during training constituting an opportunity for group problem solving (from the socio-constructivist perspective). So as to conclude, *the interactive methodological intervention (based on the theory of social constructivism) led to the improvement of the activity within the programme of psycho-pedagogic studies.* There is no general and correct "recipe" for teachers' training, it is certain that this training should adapt to any variation in society's evolution. As a multidimensional process, teaching requires the ability to synthesize, integrate and aply the knowledge in different areas, in a constrctivist manner (Hollins, 2011: 395). It is the only way to hope that teachers will be able to successfully cope with the situations they have to overcome in their career. Following the research we conducted and based on the conclusions we formulated, we consider it necessary and useful to use a set of interactive methods, which allow the learning valuing of interactivity's educational valences and the approach of personality's socio-affective and motivational dimension. The research's results confirm the three hypotheses previously formulated: the interactivity stimulation increase the cognitive acquisition (critical thinking, using practical applied competencies and communication skils); focusing on the interactive participation and using interactive methods of teaching underline the intensity of interpersonal exchange; and the high quality of the group cohesion due to the interactive participation subscribes to the long theory tradition of teacher-student relationship studies. From the methodological point of view, our research is original by the approach but it also allowes improvements when new perspective may be addressed. The research design was mainly quantitative, except the second part where lecturers identified the impact of the use of the interactive methods in a interrogative focus group. From a pragmatic point of view, the results confirm the utility and the necessity of introducing interactive methods, interactive participation and stimulation as part of the interactive learning that based on the social-constructivism theory it shows benefits for all the actors implied. More than that, introducing interactive methods into educational programmes increases not only the level of participants' involvement, but their own satisfaction. From an epistemological point of view, the paper tested a novel approach to the conceptualization and measurement of the social constructivism theory applied in a psycho-pedagogy programme, within the educational process. The measure that was developed represents an original approach combining interdisciplinary concepts and techniques founded on the large social field (educational sciences, sociology, communication etc.). Nevertheless, the constructivist theory explaines the central role of the "learning school" in the network wired society (Wittel, 2001). The place of the teacher is transforming from the main source of knowledge into the one of learning facilitator (Meyer, 2008) The role of the learning community is changing and extending more rapidly and more frequent along with the contemporary society and the new generations must be provided with social skills and competencies adapted to the new social demands.

References

Alderman, G., Green, S. (2011). Social Powers and Effective Classroom Management: Enhancing Teacher-Student Relationships, *Intervention in School and Clinic* 47(1), 39-44.

Aronson, E., & Goode, E. (1980). Training teachers to implement jigsaw learning: A manual for teachers. In Sharan, S., Hare, P., Webb, C., and Hertz-Lazarowitz (Eds.). *Cooperation in Education.* Provo, Utah: Brigham Young University Press.

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bocoș, M. (2002). *Instruire interactivă. Repere pentru reflecție și acțiune*, Cluj – Napoca: Presa Universitară Clujeană.

Cerghit, I. (2006). *Metode de învățământ,* ediția a IV - a revăzută și adăugită. Iași: Polirom.

Crawford, K. (1996). Vygotskian approaches to human development in the information era. *Educational Studies in Mathematics,* 31, 43-62.

David, C.L. (2002). *Learning Theories, A to Z*. Westport, CT: Oryx Press.

DeVries, R. (1997). Piaget's Social Theory. *Educational Researcher*, 26(2), 4-17.

Doise, W., Mugny, G. (1978). Socio-cognitive conflict and the structure of individual and collective performances. *European Journal of Social Psychology*, 8, 181-192.

Doise, W., Mugny, G. (1988). *Psihologie socială și dezvoltare cognitivă*. Iași: Polirom.

Elgedawy, M., & Summer, W. (2001). *Radical constructivism*. http://english.iup.edu/mm/Wimson/radicalconstructivism.html

Gustavsen, B. (2008). Action Research, Practical Challenges and the Formation of Theory.*Action Research* 6(4), 421-437.

Hollins, R. (2011). Teacher Preparation for Quality Teaching. *Journal of Teacher Education* 62(4), 395-407.

Ilica, A., (2009). *O istorie a gândirii pedagogice. Idei, concepții, doctrine, paradigme, instituții – de la origini până în prezent*. Arad: Editura Universității „Aurel Vlaicu".

Ionescu, M., & Bocoș, M. (2008). Procesul de învățământ – analiză conceptuală, abordări structural-sistemice, funcționale și interacționale. Aplicații. In Potolea, D., Neacșu, I., Iucu, R.B., Pânișoară, I.-O. (coord). *Pregătirea psihopedagogică. Manual pentru definitivat și gradul didactic II*. Iași: Polirom.

Johnson, D. W., Johnson, R. T., & Holubec, E.J. (1993). *Circles of learning. Cooperation in the classroom*, Fourht Edition, Eoline, Minnesota: Interaction Book Company.

Joița, E. (2006). *Instruirea constructivistă – o alternativă. Fundamente. Strategii*. București: Aramis.

Jonassen, D. (2000). Design of Constructivist Learning Environment. In *School of Information Science and Learning Technologies: Jonassen Home*: http://www.coe.missouri.edu/%7Ejonassen/courses/CLE/index.html

Kagan, S. (1992). *Cooperative Learning.* San Juan Capistrano, CA: Resources for Teachers. Inc.

Kearsley, G. (1994). *Constructivist theory (J. Bruner)*. Internet: http://www.gwu.edu/Îtip/bruner.html

Kirschner, P.A., Sweller, J., & Clark, R.E. (2006). Why minimal guidance during instruction does not work: an analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist,* 41(2), 75-86.

Mayer, R.E. (2004). Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction. *American Psychologist*, 59(1), 14-19.

Mead, G.H. (1934). *On social psychology*. Chicago: University of Chicago Press

Meyer, D.L. (2008). The Poverty of Constructivism. *Educational Philosophy and Theory*, 41(3), 332-341.

Momanu, M. (1998). Aspecte conflictuale ale situației pedagogice. In Stoica-Constantin, A și Neculau, A. (coord.). *Psihosociologia rezolvării conflictului*. Iași: Polirom.

Neculau, A. (2004). *Manual de psihologie socială*, ediția a II-a. Iași: Polirom.

O'Conner, E., Dearing, E., & Collins, B.A. (2011). Teacher-Child Relationship and Behavior Problem Trajectories in Elementary School. *American Educational Research Journal,* 48(1), 120-162.

Ogle, D.M. (1992). Developing problem solving through language arts instruction. In C. Collins&J.N. Mangieri (Eds.), *Teaching thinking: an agenda for 21st century*". Hillsdale: N.J. Lawrence Erlbaum Associates.

Opre, A. (2006). *Noi tendințe în dezvoltarea personalității* (vol. I-II). Cluj-Napoca: Editura ASCR.

Pânișoară, I.O. (2008). *Comunicarea eficientă,* 3rd edition, Iași: Polirom.

Piaget, J. (1970). *Science of Education and the Psychology of the Child*. New York: Orion Press.

Richardson, V. (1997). Constructivist teaching and teacher education: Theory and practice. In Richardson, V. (Eds.). *Constructivist teacher education. Building new understandings*. London, UK: The Falmer Press.

Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Windschitl, M. (2002). Framing Constructivism in Practice as the Negotiation of Dilemmas. An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers. *Review Of Educational Research* 72(2); 131-175.

Wittel, A. (2001). Toward a Network Sociality. *Theory, Culture & Society*, 18(6), 51-76.