Thematic Article

Deconstruction of Education

Ferenc Arató

Abstract

This paper has two different focuses. On the one hand, I examine the paradigmatic features of cooperative learning models. Cooperative learning has a revolutionary impact on practice and cognition of institutional and public education from the viewpoint of inclusion and equal access to public knowledge and to the resources that can be accessed through schooling. This impact is like a scientific shift of a paradigm described by Thomas S. Kuhn and debated by many other scientists. The present paper outlines how the basic principle-based model of cooperative learning can fulfill the criteria of a scientific paradigm following and re-reading Kuhn's theory. The main issue of the investigation of cooperative learning is how to extend the cooperative model from classroom level to public education system level. On the other hand, I argue that the post-structural approach of cooperative learning leads to a scientific shift in education. This paradigm has a structural approach which is a de-constructive one. By the means of cooperative structures we can de-construct hierarchical, racist and anti-democratic structures within classrooms, schools, school districts and the whole public education system.

Keywords: cooperative structures, post-structural approach, deconstruction, basic principles of cooperative learning, cooperative paradigm

A post-structural approach of cooperative learning

It is interesting to note a post-structural shift in educational theory and practice in the forty year-old discourse of cooperative learning. Elliot Aronson and his colleagues invented a "paradigmatic exemplar" (Kuhn, 1970) of cooperative learning by their Jigsaw Classroom model (Aronson, Blaney, Stephan, Sikes & Snapp, 1978). The idea to change attitudes and inter-ethnic relations by changing behavior first, by means of re-structuring the learning process led to a new approach focusing on the structures of learning, and the structural behavior of learners. The importance of the structural approach within cooperative discourse was recognized in the nineties (Cohen & Lotan, 1994; Kagan, 1990). Post-structural and de-constructive features of cooperative learning and its paradigmatic model were discussed within the Hungarian discourse recently (Arató, 2008, 2010, 2011; Arató & Varga, 2006, 2012; Benda 2007).

It is an obviously different approach comparing with Moreno's socio-metric model, independently from the fact that cooperative learning takes into account the socio-metric relation within a classroom situation (Johnson – Johnson, 1999; Kagan – Kagan 2009). The reason why we can see this model of jigsaw as a post-structural one is that in this model the focus is on re-structuring the given social-structures within the classroom following "mutual interdependence" (Aronson, 2007, p. 254). Mutual interdependence is better known as "positive interdependence" (Deutsch, 1962, 2006; Johnson & Johnson 1989, 1999, 2005, 2009; Kagan 1992; Kagan & Kagan, 2009) – one of the basic principles or elements of cooperative learning which was elaborated in the cooperative discourse.

Re-structuring the learning process is a post-structural action from the aspect of traditional structures of learning because it goes beyond the simple structures of a frontal class-work, traditional group work, or socio-metrically conducted classroom management. It sets up new structures with the purpose to break down the given social structures within a class of learners belonging to the same learning group and to enhance cooperation among students with different backgrounds. More precisely we should say that by the means of cooperative structures like the jigsaw structure (Aronson et al., 1978; Kagan, 1992; Kagan & Kagan, 2009; Slavin, 1995) we could dislodge ordinary and hierarchical learning structures and make an attempt to also dislodge the social structures that determine access to knowledge and common learning for socially disadvantaged children in our classrooms.

Dislodging hierarchical, discriminative and therefore anti-democratic structures of learning by setting up cooperative structures which provide increasing access and higher academic standards entails a de-constructive model. Destructing anti-democratic structures of learning by enhancing cooperation including all of the participants of the learning process – in a structurally guaranteed way - is a constructive process as well therefore we can call this post-structural approach a de-constructive one. Following Derrida's playing with the letter "a" (Derrida, 1982) we can speak about de-constr-action as well as deconstruction. Creating learning structures based on the principles of

cooperative learning is an active and constructive way to deconstruct discriminative structures of learning in any educational context. This de-constr-action helps us to deconstruct our thinking about learning, learners and facilitation of learning rooted in our hierarchical and discriminative educational heritage.

Evidence-based Model

Cooperative learning discourse renders hundreds of research studies the results of which show evidence that cooperative structures can provide more effective, efficient and fair development in education (Aronson, 2007; Cohen & Lotan, 1994; Johnson & Johnson, 1989, 2005; Slavin, 1995). Hundreds of studies teach us how cooperative structures of learning can reduce the academic gap between learners, increase educational equality, boost achievement, improve mixed-race relations, replace racism with understanding and empathy (Kagan & Kagan, 2009). Cooperative learning promotes a more constructive management of conflicts than competitive or individualistic efforts, it develops a basic self-acceptance as a competent person, it results in higher level reasoning and critical thinking competences, it enhances a more frequent generation of new ideas and solutions, and higher levels of student achievement and deeper retention (Johnson & Johnson, 1999).

Principle Based Model of Cooperative Learning – a General Model?

Having all these evidences of hundreds of research studies and decades of developmental practice, can we find a general model for understanding the difference between cooperative and sub- or non-cooperative learning structures? The Johnson brothers found five basic elements of cooperative learning (Johnson & Johnson, 1999), Kagan described four basic principles (Kagan, 1992; Kagan & Kagan, 2009) within the general seven key elements of cooperative learning, and Aronson gave us a general model, a generally accepted structure of cooperative learning – the jigsaw (Aronson et al., 1978). Can we find any "symbolic generalization" (Kuhn, 1970) by which we can understand and realize the "differentia specifica" of cooperative learning. Kagan suggests that simple basic principles should be followed in order to structure the learning process cooperatively. He calls it PIES analysis when someone follows an analysis from the aspect of the given four principles of cooperative learning described by Kagan: positive interdependence, individual accountability, equal participation, and simultaneous interaction. We have accepted Kagan's approach as a possible way of understanding a general model of cooperative learning which could contain or represent all of the significant elements of cooperative learning elaborated during the last four decades. While within the American discourse representatives of the different models of cooperative learning strictly articulated the differences between their models (Kagan, 2001) we mostly focused on a general model of understanding how to re-structure the learning process to achieve a higher level of cooperation.

Our purpose was enhancing the implementation of cooperative learning in Hungarian public education by a general model of cooperative learning based on the basic principles which were made explicit in the discourse. Therefore, Arató and Varga have completed both the description and number of basic principles. It was Kagan who articulated clearly the significance of a (post-)structural approach and tried to set up a coherent system of basic structural principles. The first attempt to understand cooperative learning as a complex system of theory and practice belongs to Johnson and Johnson (1989, 1994). They defined five basic elements or components of cooperative learning. These elements are included in our completed system of basic principles (Arató, 2010; Arató & Varga, 2006). In the following I will shortly represent the principles, as "symbolic generalizations", and a "system of laws" (Kuhn, 1970).

Open and flexible structures of learning

Following Kagan (Kagan, 1992) we can call cooperative structures only those learning structures in which all of the basic principles are built-in to the steps of the learning process. According to the principle of *using open and flexible structures* of learning we should first accept and understand that we are on the way of re-structuring the learning process in our everyday practice, so we should focus on structures of learning. Our structures should be open for different individuals' self-actualizations, different academic fields, inter-disciplinary issues, spontaneous reactions of the participants not to risk the positive role of structures enhancing the learning process.

According to this and the new roles of teachers elaborated structures must be flexible to accompany the individual needs of different participants. New tasks of teachers like designing cooperative structures; monitoring; intervening and modeling; and facilitating group processing, team building need flexibility from both of the side of the teachers and the learning structures. The openness and flexibility can be easily arranged, structured by means of the completed and extended system of the basic principles of cooperative learning (Arató, 2011; Arató & Varga, 2006).

Positive Interdependence: Encouraging and Constructive Interdependence

Positive interdependence as a basic element of cooperative learning was elaborated by the Johnson brothers based on Deutsch's teaching about competition and cooperation and the role of interdependence. It is more than a half century old discourse about social interdependence and the distinction of positive and negative interdependence (Deutsch, 1949, 1962, 2006; Johnson & Johnson 1994, 1999, 2005, 2009). Structurally we could say that teachers should structure the learning process so that none of the participants could complete his/her assignment without the others. The Johnson brothers described eight types of positive interdependence (Johnson & Johnson, 1999). We left out *reward* and *outside enemy interdependence* from the list following the guidelines of client-orientated psychotherapy and assertive communication (Rogers, Gordon, Rosenberg) and described this narrower list of positive interdependence as *encouraging and*

constructive interdependence. Interdependence is encouraging when learners have a *goal, resources, role, identity, environmental, and task interdependence* therefore someone should turn himself/herself towards cooperation because of the settings and structures of learning activities independently from the state of his/her cooperative attitudes, skills, knowledge, and experiences. Those are the positively interdependent structures of cooperation in which someone can't avoid working together with the others, even when someone would like to articulate his/her non-participative attitude towards learning and learning together with others – in a cooperative structure every single participant can articulate his/her attitude regardless from its content. Within positively interdependent structures it is self-actualization and spontaneity in a pro-motive contact within interpersonal relations (2-4 persons in a micro-group) which maintains motivation in learning. That is the reason why we call these types of interdependence – mainly described by Johnson and Johnson – *encouraging interdependence*.

From another aspect of interdependence teachers should *structure the learning process so that every participant could build on every other participant's knowledge, attitudes, and skills*. From this aspect of interdependence we comprehend learning as a constructive process where every individual's efforts complete the others' efforts, and knowledge as a common social construction. Connecting the resources of the group of learners who are learning together as a learning community, consciously builds members' knowledge, skills, and attitudes to each other – that is *constructive interdependence*.

Personally inclusive parallel interaction

This principle counts and increases the number of interactions in certain a period of time during the learning process as Kagan defines it (Kagan & Kagan, 2009). Arató and Varga have completed this definition with the concept of personal involvement to emphasize the importance of having all the participants engaged in communication of learning. If teachers increased the number of interactions to the highest level of structuring the learning process by pair-work they can achieve involvement all of the participants. At the same time teachers should concentrate on the characteristics of the interaction as well. It means that they should provide those kind of interactions in which the participants can enter with their whole personality articulating their feelings, demands, needs, opinions, knowledge, or solutions related to the subject of expected interaction.

Kagan uses the word simultaneous interaction instead of parallel interaction and this expression has a special connotation from the world of chess where there is a master who sets up the board and plays simultaneously. In our understanding parallel interaction does not contain any single privileged person not even the facilitator of learning.

Equal Access and Participation

In the literature of cooperative learning this principle is known as *equal participation* which means that teachers should structure the learning process so that every participant could participate equally. From a social-psychological and socio-linguistic aspect we completed this definition by the expression of equal access (Arató & Varga, 2006) which means that the facilitator of learning should also concentrate on accessibility beyond participation. This means that teachers should provide access for everyone who is participating independently from their capacity of participation. For example, if the teacher asks the micro-group members to share their ideas about an issue one after the other, it seems that he/she provides equal participation but if one of the group members does not speak in the given working language, his/her participation is inhibited because of a lack of access. Similarly, in a situation in which teacher gives an assignment to the learners working in the same language but with different social backgrounds, there is no equal access. In these situations teachers should provide resources for those who have no access to them and therefore cannot participate equally.

Personal Responsibility and Individual Accountability

Cooperative learning proceeds from the concerns, needs and expectations of the learning individuals. It strives to respond to everyone's – the facilitator's and the learners' – individual concerns and needs during learning together. Learners work in micro-groups in order to ask their questions, to engross their claims and ideas, to give account of their knowledge and to ask for help whenever they need to – to become more and more autonomous as learners and independent from the facilitator in these actions. The Johnson brothers (Johnson & Johnson, 1999) and Kagan (Kagan & Kagan, 2009) describe in detail what individual accountability means. As the Johnson brothers write "individual accountability exists when the performance of each individual is assessed, and the results are given back to the individuals and the group to compare against a standard of performance…" (Johnson & Johnson, 1999, p. 80).

Arató and Varga have a different view of personal responsibility and individual accountability. Personal responsibility is dependent on the inclusive characteristic of the learning process. When a learning process is flexible and open enough to make the learners respond to the challenges of a learning situation then personal motivation is growing (see Bálint, 2013a, 2013b). Personal responsibility starts with a call for the learners to enter into the learning process. If someone can respond he/she can take the responsibility for his/her learning. Personal responsibility begins with the openness and flexibility of the designed learning process. From another aspect personal responsibility is part of the shared responsibility of the group members for their joint outcome – as the Johnson brothers describe (Johnson & Johnson, 1999). In the focus of this outcome it is the individual strengthening of the group members so they should take responsibility personally for their own task to enhance the development of that of the others.

Personal responsibility could be enhanced by cooperative roles as well. In cooperative structures of the micro-groups, everyone has a role. These roles are the behavior patterns supporting learning together. These are tools invented to develop such competences that are necessary according to the facilitator's and the learners' concerns and identified needs. It is important to emphasize in reference to responsibility that the participants will not accomplish their assignments because of the facilitator's demands. They will rather accomplish them because they are personally motivated or because the cooperative structures call them to account for their assignments. The emphasis is laid on personal responsibility before the bearing of individual accountability. We should emphasize that teachers need to open the learning structures for the personality of the learners. If they can enter the learning process by their whole personality that could help them to feel involved, to express their needs and demands frankly and to find specific assignments or tasks for themselves. Shortly, they can take personal responsibility for their tasks. The success of these are ensured by the fact that in cooperative learning teachers structure the learning processes so that every single participant has individually customized – according to their concerns and identified needs – and clearly expressed assignments publicizing the criteria of accomplishment and assessment, for which one must bear personal responsibility.

Individual accountability is not unknown in the individual and competitive systems of learning. The individuals must bear responsibility for themselves in these systems as well. Cooperative learning, however, does not just shift the responsibility of learning onto the participants' shoulders, but places tools into their hands to accomplish their assignments successfully. These kinds of tools are the cooperative roles mentioned above, which entail the behavior patterns and the related cooperative structures and tools for learning together successfully.

The development of individual accountability is supported in the same way by the differentiated, individually customized tasks that are built jigsaw-like on each other, through which cooperative learning leads to learning forms with the help of cooperative roles. The roles can be exchanged among the group members after everyone has acquired the desired cooperative behavior patterns linked to them. As a result, everyone has the chance to use every tool and acquire every behavior pattern needed to accomplish their clearly expressed individual assignments more consciously and to give an account of their accomplishments.

Individual accountability is enhanced by the persistent step-by-step publicity of the micro-groups. If someone permanently works together with their peers, then there will be besides him/her at least two or three members of the group, who are fully aware of the accomplishments of their allocated and accepted assignments.

Critical and pro-motive publicity provided step by step

Publicity is a basic issue in the case of open, flexible, and cooperative structures. It is not an additional element or phenomenon it should be a guiding principle – and a structurally guaranteed one. Within the Hungarian discourse of the cooperative paradigm we have inserted critical and pro-motive publicity into the list of basic cooperative principles.

The first dimension of critical, reflective, and productive publicity is the publicity of the micro-groups. A continuous publicity of a "base group" (Johnson & Johnson, 1999) should float in the mind of the teachers during the designing process for ensuring the presence of the basic principles of cooperative learning, and to pre-map the specific needs and demands that the offered cooperative structures require from the participants. Within this publicity, cooperative structures, roles, comprehended principles help to coordinate interactions among the group members, and encourage the personal presence of the participants, improving congruence and empathy among the group members

Another dimension of critical and pro-motive publicity is at the whole group level. In order to achieve all individuals' learning goals and needs documentation plays an important role in a cooperatively structured learning process, as a structural tool of providing publicity for the learning materials, products, performances, and resources. Cooperatively structured tools for documentation are much more effective, efficient and fair for large group documentation because in a certain period of time the highest number of personal articulations of needs, demands, solutions, knowledge etc. could be achieved involving every single participant personally. With a Placemat/Window structure in 6-8 minutes we can collect ideas, needs, and solutions in a large group of learners by means of the cooperative micro-group structure of groups of four.

Step by step promoted documentation should be prepared within cooperative structures (like Placemat/Window structure, where individually collected items of learning are shared in a comprised, cooperatively structured, and documented way) and encourage participants' pro-motive interactions to articulate their individual learning products, processes, and items. In a Roundtable structure (where after each other every micro-group member shares an item of his/her individual work, and the member next to him/her should write it down onto a common note paper) publicity of the individual work is promoted by the helping hand of the writer group mate (and the others too) for the purpose of articulating the individual work-item clearly. When conflicts occur within micro-groups, teachers should intervene in the micro-group's work and teach conflict resolution competences immediately related to the given conflict situation.

Structurally guaranteed ways of self-actualization, expressions of interest, and sharing emotional impressions can induce conflicts within the publicity of micro groups. These conflicts are important parts of the competence based learning process because they can

explore and cover all dimensions of a competence from the personal (self-esteem, motivation, conscientiousness etc.) and social competences (empathy, tolerance, small group competences etc) related with the given learning and conflict situation, and all of the related learning (like key competences: literacy, mathematical competences etc.) and cognitive competences (like wide repertoire of thinking skills of the Bloom taxonomy) as well. From this aspect of publicity facilitators can immediately monitor the progress of the learning process, the behavior of the learners – they can make observations of every single participant within concrete, contextualized learning situations. Structurally guaranteed publicity of a micro-group privileges critical and pro-motive attitudes towards cooperation and common learning. In the beginning facilitators intervene when detours of common learning occur. Facilitators use the publicity of cooperative learning processes for enhancing critical and pro-motive interactions among students by intervening and developing the necessary competences. Within the cooperatively structured learning process ways of documentation of the learning process help raise the level of critical and pro-motive interactions. In a Placemat structure group members want to understand the ideas, shared learning items of the others to achieve a relevant comparison for the purpose of documentation – because they should decide how many times the given item occurs among the micro-group member. This is a structurally guaranteed critical and pro-motive understanding of each others. In a Roundtable structure (described above) the writer helps the articulation of the given items of his/her group mate, because he/she has the opportunity to record it as clear as it could be for future utilization of the recorded document.

Cooperatively structured step by step documentation helps to follow the learning activity of the participants, how they can cope with the situation that the given learning activity stimulates. It means that the visual representation of the learning activities (texts, pictures, diagrams, maps, figures, illustrations etc.) can show the progress of the learning process step by step for the facilitators of learning. With the help of continuous documentation it is easy to recognize where and when should a teacher re-plan, re-design, re-structure, or stop the learning process noticing new needs, demands, and the emerging objectives of the learning process and the participants.

A critical and pro-motive aspect of this publicity can be understood easily if someone comprehends the importance of peer-reflection and authentic assessment in competence development. Critical is the same adjective here as in the concept of critical thinking. Critical means that through these dimensions of cooperatively structured publicity they will be able to reflect to their own competences, on the ways how these competences could be developed, and they can examine their competences from multiple perspectives.

Conscious Development of Personal, Social, Cognitive, and Learning Competences

This is the only principle which is not structural but needs structural guarantee. This basic principle could be seen as a general preventive strategy more than a principle.

Following this principle, teachers should lay out their cards of expected outcomes, of developmental goals. In cooperative learning competence development goals and expected outcomes are shared with the learners, so they can follow consciously both their own development plans and those of their peers. Cooperatively structured learning processes have two goal structures. One of these is for academic goals; the other is for the goals of cooperation and personal competences. In our view of the Hungarian reception of cooperative learning it means that teachers together with the learners should target their common learning objectives based on the individual needs of the learners. It is not enough to target academic goals and expected outcomes, there is a deep need for targeting the specific personal, social competences ("Interpersonal and small group skills" as the Johnson brothers called it in Johnson & Johnson, 1999) as expected outcomes related to the identified needs and demands of the learners. This means that teachers and learners decide together which personal and social competences they will improve consciously in a certain period of the learning process. The same strategy should be used for the development of cognitive and learning competences as well.

Paradigmatic Features of Cooperative Learning

Basic Principles as Symbolic Generalizations

Kuhn claims that "symbolic generalizations … function in part as laws and in part as definition of the symbol they deploy" (Kuhn, 1970, p. 182). Basic principles are structural laws of a more effective, efficient and fair way of cooperation than hierarchical and discriminative structures of the educational heritage or tradition as we could see from the evidences of the last four decades. Basic principles are laws of structuring a learning process in a more cooperative way.

The system of basic principles I have described above defines new "symbols" of these laws. The cooperative principle or "law" about providing *positive interdependence* to enhance cooperation and de-construct discriminative relationships and stereotypes describes the definition of interdependence and the differences between positive and negative goal structures, positive and negative interdependencies.

The *positive interdependence* principle that regards the importance of increasing the number of *personally inclusive parallel interactions* during the learning process defines a structural approach of large group communication from the aspect of personal and pro-motive interactions. It also helps us realize that in a learning centered approach we need to provide more and more time for personal, "face to face, knee to knee, pro-motive interactions" (Johnson, Johnson & Holubec, 1994) in our classrooms.

The basic principle of providing *equal access and participation* during the learning process defines equity issues from a structural viewpoint: do all participants have equal access to learning step by step during the learning process? Do all participants of the learning process participate differently but equally in the learning process step by step?

Do all participants share individually but equally all the benefits of learning and education?

Personal responsibility sheds light on the importance of the spontaneity and autonomy in learning, giving way to the "self-actualization tendency" (Rogers, 1995), and provides self-decision-making structures during the learning process. If someone is able and willing to participate he/she can personally be responsible for his/her task. *Individual accountability* means that authentic assessment could be a way of re-thinking the issue of accountability. If we can provide continuous partner-centered peer-feedback, a supportive base group (Johnson & Johnson, 1999) and a cooperative learning community around the individuals they could be individually accounted more effectively – providing so a supportive, always on the spot helping hand which is structurally guaranteed. In this definition of individual accountability – as one of the "symbols" of this basic principle – accounting is part of the autonomous learning process. Individual accountability helps participants recognize, realize, and understand their needs and demands of development in learning, and it provides or offers resources which they can autonomously satisfy their needs of development with.

The principle of *critical cooperative publicity provided step by step* refers to the meta-reflective level of communication and understanding. Increasing time for personal interactions should be helped in the beginning to keep the cooperative structural focus of public communication and representation, which does not let the social structures dominate the learning process. The rule is to insist on the basic principles of cooperative learning during interpersonal communication, providing representation of the learning process step by step. This principle enhances equal access beyond the given learning community because anyone could follow the learning process following the step by step representations. This "law" of critical cooperative publicity defines it as a representation of the learning process with the help of guaranteed basic principles of cooperative learning. A wide repertoire of individual articulations could be encouraged and supported in such a way that freedom of thinking, speaking, learning and interaction could be provided. From another aspect this critical cooperative publicity provides authentic assessment of learning, the learning process and beyond – of the level of reflective thinking. Within this publicity participants can reach meta-cognitive, structurally reflective levels of reflection – which helps them to develop their competences to see, reflect and act "within the Big Picture".

The basic principle of conscious intra- and interpersonal, cognitive and learning competence based development is not a structural one but defines the main fields of development where we should focus in competence based developmental models and practices to help participants develop consciously and autonomously their competences which are needed for success in learning, living, and in (de)constructive self-actualization.

Cooperative Structures as Values

With the help of the symbolic generalization of the basic principles of cooperative learning we can examine and analyze any kind of learning structures. This means that cooperative learning is *fruitful* for independent researchers too. If a learning structure contains all of the basic principles of cooperative learning, a more effective, efficient and fair learning process could be achieved (compared to individual or competitive structures). If some of the principles are missing, basic principle analysis helps to find structural solutions for the problem of underachievement or discrimination. We use the expression *PIES analysis* referring to the completed and extended list of basic principles of cooperative learning – as new pieces for the PIES of cooperative discourse – which was described above as a possible general model of the cooperative discourse.

Following the basic principles of PIES analysis, during planning, realizing, and evaluating our own educational practice leads to a de-constructive series of actions. This de-constructive structural activity offers partner-oriented and more democratic learning structures compared to hierarchical and teacher-centered structures, and by this dislodges the traditionally discriminative and anti-democratic structures of learning. From this viewpoint we can widen the interpretation of the concept of deconstruction if we can recognize the importance of active structural change in learning and education, the importance of continuous cooperative *de-constr-action*. The learning structure is one side of the issue only – but the cooperative approach of it has new "puzzle-formulations" (Kuhn, 1970, p. 184) and evidence-based solutions even to the old "puzzles" of underachievement, academic gap, discrimination, and inter-ethnic conflicts in traditional public education.

The evaluation could be very simple. If a learning structure contains all of the basic principles step by step we can call it a cooperative structure independently from the relation of the examined practice and the cooperative discourse. If some of the principles are built-in, some of them are missing we can evaluate this practice as sub-cooperative practice from the viewpoint of cooperative learning. If we could find a structure without any of the basic principles of cooperative learning we can evaluate that structure as a non-cooperative one.

The structures which have the basic principles built into their steps (Kagan) could be seen as cooperative structures which represent the "values" (Kuhn) of the cooperative paradigm. Following the basic principles opens an endless opportunity of structuring the learning process cooperatively in an autonomous way so the "application of the values is sometimes considerably affected by the features of individual personality and biography that differentiate the members of the group" of scientists of the same paradigm as Kuhn pointed out. So the different structures and models of cooperative learning which are widely shared as values can be seen as part of a general model of the cooperative paradigm if the basic principles of cooperative learning are represented in them.

As Kuhn writes paradigmatic values must "permit puzzle-formulation and solution; where possible they should be simple, self-consistent and plausible, compatible" (Kuhn, 1970, p. 184). Cooperative structures are formulated by means of basic principles as puzzle formulations and solutions following the simple PIES analysis of cooperative learning. Therefore, cooperative structures are *simply* solutions which are based on the new symbolic generalizations of the cooperative discourse. Cooperative structures and their benefits, motifs and effects are *compatible* with the theory and scientific research results of the last decades of psychology, social-psychology, sociology, and educational science. Research studies show that cooperative structures are "socially useful" (Kuhn, 1970, p. 184) as well.

The Jigsaw Structure as a Paradigmatic Exemplar

The paradigm as a shared example is a central element of Kuhn's teaching about the scientific shift. Different forms of *Jigsaw* are the most widely shared examples of a cooperative structure (Arató & Varga, 2006; Aronson et al., 1978; Cohen & Lotan, 1994; Johnson, Johnson&Holubec, 1984, 1994; Kagan, 1992; Kagan & Kagan, 2009; Slavin, 1995). The *Jigsaw* structure described in many versions is mainly related to Aronson's model of cooperative learning (*The Jigsaw Classroom*, Aronson et al, 1978, Aronson 2007), although a lot of different models of *Jigsaw* exist.

The Jigsaw structure is one of the most widely known cooperative structures and it is a reference for all of the authors who identify themselves as members of the cooperative discourse. Approaches, realized components, and defined key-elements may be different in these models of cooperative learning but the application of jigsaw structures within the learning process is a common basic reference for all. The Jigsaw structure is a shared common example for understanding how we should re-structure the learning process to achieve positive interdependence among learners with different backgrounds. We should say – following Kuhn's metaphor of paradigm – that this is not only an example. It is an "exemplar" which displays what a cooperative structure is in reality, how it facilitates learning, and what evidences we can find observing a learning process structured by a *Jigsaw*. Kuhn writes about paradigmatic exemplars as a commonly shared new solution, a new "seeing" of solution for given, re-formulated, newly articulated problems:

"One of the fundamental techniques by which the members of a group, whether an entire culture or a specialists' sub-community within it, learn to see the same things when confronted with the same stimuli is being shown examples of situations that their predecessors in the group have already learned to see as like each other and as different from other sorts of situation." (Kuhn, 1970, p. 192)

So we can announce that *Jigsaw* structures are paradigmatic exemplars for the cooperative discourse. By understanding the importance of *Jigsaw*structures we can reach a new horizon of understanding the learning process – following a *Jigsaw* model

we can dislodge the inherited discriminative structures of learning by setting up a cooperative structure. *Jigsaw* models make it obvious that the focus is on the structures of learning – in cooperative discourse everything starts with a deconstructive action: re-structuring the group of learners into a cooperative micro-group structure and re-structuring the learning process into a cooperative structure.

Kuhn also writes that the members of the same paradigm can display this common "seeing" through these paradigmatic exemplars whether they have symbolic generalizations, systems of laws or not. I would say that this is the same phenomenon within the cooperative discourse – *Jigsaw* could be a paradigmatic exemplar for the discourse and symbolic generalizations – the basic principles of cooperative learning were articulated later (except the aspects of mutual or positive interdependence and equity).

That is another evidence for accepting this approach that j*igsaw* structure contains all of the later articulated basic principles. The jigsaw structure provides *positive resources, task and role interdependence* among learners – every member of the micro-group is working with a different part of the material they all should know. Micro-groups, learners working on the same material from different groups, group members teaching each other, asking each other – all these activities are *interactions running simultaneously* and every group member should join the interaction because they have their own unique contributions that they are responsible for. Every group member has his/her different part of the problem (theme, issue, period of time etc.). This phase could be individualized covering the needs, demands, and achievement of every single participant – so they can be responsible for their part of the common task. In Kagan's or Slavin's *jigsaw* there are "professional" groups for the learners working on the same section of the material which enforce the learners to take *responsibility personally* when they are going back to their original micro-group to teach the others about their part of the material. *Individual accountability* occurs when in a professional group the members should share what they have learnt from the same topic (from different or the same resources). Then afterwards this occurs again when they should teach their part to the others in their original group. When they are measuring their understanding and knowledge individually it happens again – how effectively the given part of the material was taught to the others. In the debriefing, group processing session it occurs again when every participant could understand what was successful, what is in need of development in their individual activities of learning and teaching others. *Equal participation and access* is provided and enforced by the resource interdependence, everybody should share his/her part to help every group member to understand the whole material. Access can be reinforced by individualization of the resources within the given part of the material: someone can read books, others can work with the textbook chapters, others need other types of resources, and facilitators of learning should pay attention to providing real access for every single participant. Implementation of professional groups for the learners, working on the same material to prepare for

teaching other group members increases accessibility independently from the fact that they were learning from the same material or from different resources about the same topic. All of the learning materials in a Jigsaw structure are shared in micro-group publicity, so every participant gains structurally guaranteed interpersonal and interactive access with the help of the *pro-motive publicity* of this structure. *Critical publicity* occurs when they assess individually their learning achievement, teaching efficiency, and the learning-teaching activities that were used.

Beyond Classrooms and Schools – Deconstruction of the System

As we have seen it is possible to set up cooperative structures within classrooms, and on institutional and district levels (Johnson & Johnson, 1994) which could be significantly more effective, efficient and fair than individual or competitive learning structures. Having structured the learning process cooperatively, we can ensure higher academic achievement, decreasing academic gaps, higher level reasoning skills, better mental balance, good self-esteem, and non-discriminative inter-ethnic relationships by dislodging hierarchical, anti-democratic structures, and destructive interpersonal and intrapersonal relations. The "puzzles" which are represented in our public education systems are clear: segregation of learners with different cultural and social backgrounds, increasing academic gaps, lower academic achievement, lack of success in the field of personal and social competence-development etc., in one words the lack of inclusion.

There has been an attempt to develop the Hungarian public education system into a more inclusive one during the last decade on the policy level and on everyday practice level as well. An Inclusive System of Education (ISE) model was elaborated in a one and a half year pilot program (2002-2003) including 45 schools, civic experts and the Ministry of Education. This model offers recommendations and aspects of ISE development – schools can choose, design and plan autonomously and independently their own ISE model which can guarantee the expected outcomes and results of inclusive practice. There was a debate on policy level whether desegregation should be compulsory (including all of the public education institutions) or voluntary (involving all pro-active stakeholders, institutions, workshops, and universities). We have evidence about how to best cope with this issue from as early as the 1970s. For example, in the states of the USA where it was compulsory for every federal educational institution to participate in desegregation and integration the results displayed a decreasing gap among learners with different backgrounds (Aronson, 1972, 2007), in those states where desegregation and integration were not compulsory, the increase of racism, and the academic gap between learners was observed. In this debate in Hungary the political decision makers were not courageous enough to vote for the compulsory strategy. Following the strategy based on the pro-active participants in integration efforts, a cooperative principle based model of network services was established focusing the individual and individually different needs of every single educational institution participating in this ISE development program. During the pilot program mentioned above all of the sequences of an ISE development were explored and described. The

National Education Network for Inclusion (NENI) supported the development of a cooperatively structured network services model (Basic-institute Model). This model is an extrapolation of the general model of cooperative structures (Arató, 2010; Arató & Varga, 2005; Arató,Pintér & Varga, 2008).

This model provides human and material resources in an individualized and immediate way for the ISE development of educational institutions (kindergartens, primary schools, high schools etc.) which could be planned, designed, devised by the ISE project-organization of the given institution which should have involved all of the staff members belonging to the given institution. The given institution applies for its own, differentiated resources by its "personalized" ISE development strategy and working plan, which means that they will get the resources to what they really need, which could be seen as *equal access and participation*. Offered services of the network are *simultaneously and interactively achievableby structural elements* of the schools like ISE micro-groups of two to five staff members (ISE management group, ISE institution development groups, ISE supporting partnership groups). This structural condition raises the level of personal *responsibility and individual accountability*, and enforces the changes on the institutional level because the ISE micro-groups are in charge of different parts of the whole ISE development program, so the work of the ISE micro-groups are *positively interrelated and interdependent*. Different services bound with the different aspects or fields of ISE are available in this Basic-institution Model from which the given institution can easily choose the needed resources for its own, unique developmental needs. Our research studies show that the horizontal forms of services – like whole staff training events, regional training, mutual visits, community building, workshops for regional ISE institutions, involvement of local stakeholders etc.) play a significant role for schools to reach a higher level of internalization of the ISE development objectives, and of continuation of the ISE development of their everyday practice for years. Our first examination was based on an analysis of official documents of the participating institutions focusing on the internalization of the ISE development competences, basically regarding with the objectives and attitudes of ISE, and ISE development services (Arató & Varga, 2005). Three years later in our second examination relying on a wider repertoire of research methods we found that the cooperative element of the Basic-institution Model plays an important role for the participating institution for their ISE development despite the fact that the whole model was ignored from around 2005 as a complex network model for ISE services, therefore only some elements of it were available for the ISE institution (Arató et al., 2008). We can announce that the general model of cooperative learning based on the completed system of basic principles of cooperative learning traits all of the features of a paradigm. We can implement the symbolic generalization and paradigmatic values of the cooperative learning discourse on system development level as well – with the help of the cooperative paradigm we can enhance the inclusiveness of the institutions, and de-construct segregating and discriminative systems, practices, and dynamism of public education (Arató, 2010). The

Basic-Institution Model as a model for autonomous, individualized process for ISE development was described recently (Arató & Varga, 2012).

Future Research

We should continue our study in two dimensions. One of them is ISE development and adaptation in everyday practices of ISE institutions – have they been able to deconstruct hierarchical and segregating forms of education in their everyday practice? Are the actions related with ISE development de-constr-actions in real? The other dimension is the level of educational policies. Are they supportive of an ISE development and services network in the future or not? How do the changes in our public education system influence the progress of a ten-year development plan in public education for a more inclusive society?

References

Arató, F. (2008). A kooperatív tanulás szerepe az IPR alapú intézményfejlesztésben [The Role of Cooperative Learning in ISE based institutinal development]. In F. Arató (Ed.), Kooperatív tanulásszervezés az integráció szolgálatában (pp. 7–12). Budapest: Educatio Kht.

Arató, F. (2010). Egy általános kooperatív modell lehetőségéről [An Opportunity of a General Cooperative Model]. Iskolakultúra, 20(1), 106–116.

Arató, F. (2011). A kooperatív tanulásszervezés paradigmatikus jellege [Paradigmatic Feature of Cooperative Learning]. In T. Kozma & I. Perjés (Eds.), Új kutatások a neveléstudományokban (pp. 11–22). Budapest: ELTE Eötvös Kiadó,.

Arató, F. & Varga, A. (2005). A kooperatív hálózat működése[Cooperative Network in Process]. Pécs: PTE BTK, Neveléstudományi Intézet, Romológia és Nevelésszociológia Tanszék.

Arató, F. & Varga, A. (2006). Együtt-tanulók kézikönyve – Bevezetés a kooperatív tanulásszervezés rejtelmeibe [Handbook for cooperative learners – Introduction to cooperative learning]. Pécs: PTE BTK, Neveléstudományi Intézet, Romológia és Nevelésszociológia Tanszék.

Arató, F. & Varga, A. (2012). Intézményfejlesztési útmutató a differenciált, IPR alapú fejlesztések megvalósításához [A Guide for Differentiated and ISE Based Institutional Development]. Budapest: Közigazgatási és Igazságügyi Hivatal.

Arató, F., Pintér, Cs. & Varga, A. (2008). Az Országos Oktatási Integrációs Hálózat rendszerszerű működésének vizsgálata [Examination of the Systematical processes of the National Network for Inclusive Education]. Budapest: Research study. Manuscript.

Aronson, E. (1972). The Social Animal. New York: W. H. Freeman and company.

Aronson, E. (2000). Nobody left to hate: Teaching compassion after Columbine. New York: Henry Holt.

Aronson, E. (2007). The Social Animal. New York: Worth Publishers.

Aronson, E., Blaney, N., Stephan, C., Sikes, J. & Snapp, M. (1978). The Jigsaw Classroom. Beverly Hills: Sage Publications,

Benda, J. (2007.) Örömmel tanulni [Learning with Joy].Budapest: Agykontroll Kiadó.

Bálint, Á. (2013a). Élethosszig tartó tudás? – Érvek a belátásos tanulás mellett [Life Long Knowledge? – Arguments Supporting Insight Learning]. In R. Fóris-Ferenczi J., Marchis & J. Ozsváth (Eds.), Tudás és tanulás (pp. 143–148). Kolozsvár: BBTE.

Bálint, Á. (2013b). Insights about Insight Learning. In H. Andl & Zs. Molnár-Kovács (Eds.), Iskola a társadalmi térben és időben 2011-2012.II. kötet (pp. 31–37). Pécs: PTE.

Cohen, E. G. & Lotan, R. A. (1994). Working for Equity in Heterogeneous Classrooms, Teachers. New York – London: College Columbia University.

Derrida, J. (1982). "Différance." Margins of Philosophy.Chicago:University of Chicago Press.

Deutsch, M. (1949). A Theory of Cooperation and Competition. Human relation, 2(2), 129–152. DOI:10.1177/001872674900200204

Deutsch, M. (1962). Cooperation and Trust: Some Theoretical Notes. In M. R. Jones (Ed), Nebraska symposion on motivation (pp. 275–319). Lincoln: University of Nebraska Press.

Deutsch, M. (2006). Cooperation and competition. In M. Deutsch, P. T. Coleman & E. C. Marcus (Eds), The handbook of conflict resolution – Theory and practice (23-40). San Francisco: Jossey – Bass.

Johnson, R. T. & Johnson, D. W (1989). Cooperation and Competition: Theory and Practice. Edina: Interaction Book Company

Johnson, R. T. & Johnson, D. W. (1994). Leading the Cooperative School.Edina: Interaction Book Company.

Johnson, R. T. & Johnson, D. W. (1999). Learning Together and Alone. Massachusetts: Allyn and Bacon.

Johnson, R. T. & Johnson, D. W. (2005). New Development in Social Interdependence Theory. Genetic, Social, and General Psychology Monographs,131(4), 285–358. DOI:10.3200/MONO.131.4.285-358

Johnson, D. W. & Johnson, R. T. (2009). An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning. Educational Researcher vol. (38) 5. 365-379. Doi:10.3102/0013189X09339057

Johnson, D.W., Johnson, R.T. & Holubec, E. J. (1984). Circles of Learning. Alexandria: Association for Supervision and Curriculum Development.

Johnson, D.W., Johnson, R.T. & Holubec, E. J. (1994). The New Circles of Learning. Alexandria: Association for Supervision and Curriculum Development.

Johnson, D. W., Johnson, R. T. & Stanne, M. B. (2000). Cooperative Learning Methods: A Meta-Analysis. Minnesota: University of Minnesota.

Kagan, S. (1990). The Structural Approaches to Cooperative Learning. Education Leadership, 46(12), 12–15.

Kagan, S. (1992). Cooperative Learning. San Clemente: Resources for Teachers.

Kagan, S. & Kagan, M. (2009). Kagan Cooperative Learning. San Clemente: Kagan Publishing.

Kuhn, T. S. (1970). The Structure of Scientific Revolutions. Chicago: The University of Chicago Press.

Marzano, R., Pickering, D. & Pollock, J. (2001). Classroom Instructions that Works: Research Based Strategies for Increasing Student Achievement. Alexandra: Association for Supervision and Curriculum Development.

Rogers, C. (1995). On becoming a Person (A Therapist's View of Psychotherapy). Boston, New York: Houghton Mifflin Company.

Slavin, R. E. (1995). Cooperative learning theory, research, and practice. Boston: Allyn and Bacon.