

LEARNING OF COMPLEX AND CRITICAL THINKING: A MATTER OF DIDACTICS OR SOMETHING ELSE?

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Zavod za šolstvo

Three levels of assuring complex and critical thinking

In the present paper we are discussing about three levels of assuring a learning environment that will contribute to the developing of critical and - in the broadest sense - complex thinking.

The first level refers to the classroom practice: how a teacher can contribute with his practice to stimulating pupils' thinking activity.

The second level refers to the level of individual schools: how much support does a teacher get from his school? Do the schools assure such a climate within the context of their vision and developmental planning which enables the development of complex and critical thinking?

The third level refers to the school policy, to the prevailing pedagogical discourse or paradigm conflict and also to wider social conditions as a broadest frame, which prescribe the limits of possible and the ability to reflect and to exceed them.

None of these levels can be omitted by assuring complex and critical thinking otherwise the whole »enterprise« will fail.

Complex thinking for the »school use«

We should look first, where the contemporary efforts for developing complex thinking or various thinking process arise from.

One of the most influential by lightening the nature of learning and principles of knowledge organising was cognitive psychology. From the early beginning in the 50's its approach to research on learning is

multidisciplinary oriented. It is connected with the developmental psychology, anthropology, linguistics, philosophy, computer sciences, neurology and other branches of psychology.

There are a plenty of more or less exhausted lists and taxonomies of various aspects of thinking: of its processes, components and skills ... One of the most referential classifications of complex thinking arose as a result of collaboration of many experts from the field of cognitive psychology, sociology, philosophy and the so called educational sciences. Based on the analysis of different taxonomies and work of well known authors such as Sternberg, Gardner, Andersen and others (included philosophical references) the group of authors from the USA, gathered around Robert Marzano (1989, 1993, 1997), has prepared the classification of thinking skills and processes especially for the school purposes. This classification will serve as an example to illustrate how to contribute to the development of complex and critical thinking in schools.

Authors stressed that they didn't offer a general model of mind but wanted to expose the areas that are common to different approaches and different subjects and to show how to use them thoughtfully in concrete school situations. They put the attention especially to thinking processes and to thinking skills which contribute to this processes and to critical, creative and metacognitive thinking. These elements are in the mutual and complex interrelations and run together (Marzano et al., 1988).

The above mentioned authors conceptualised thinking processes as forming and creating concepts, understanding, deciding, problem solving ... Thinking processes are treated as complex and goal oriented operations, that originate from combining basic thinking skills such as observing, classification, arranging, finding out characteristics and components, analysing relations, making conclusions, predictions, restructuring, evaluating ... (for example: classification and comparison skills are often a part of decision and problem solving processes, skills of making inferences and abstractions are those which contribute to the process of concepts building and so on).

Creative and critical thinking are not identical with thinking processes such as problem solving or decision making. They are their characteristic, for example: problem solving or decision making are more or less creative and more or less critical (ibid.).

Critical thinking is in the first place evaluative (we evaluate different concepts and ideas), but creative thinking is more generative (we generate concepts). The stress in the critical thinking is therefore on testing and

judgement of findings or statements, and also on creative thinking on validity and usefulness. But for both of them it is characteristic that they contribute something new.

One of the most known classifications of critical thinking (Ennis in Baron in Sternberg, 1987) poses the following thinking skills as skills that take part in critical thinking: elementary clarification of the problem (focusing on questions, analysing arguments, questions for the further clarification), the judgement or credibility of sources by various criteria, making inferences in different ways, problem defining strategies and identification of suppositions ... Also the auto-reflexiveness – reflecting your own ideas and actions – is relevant in this context.

The view of complex and critical thinking and of the relations between them as it was presented above is one of the possible perspectives. We have adopted it for our purpose, because it is systematic, transparent and operative and it helps think which strategies to use for the developing of this field in schools.

How to stimulate complex and critical thinking on the level of classrooms

The most direct initiatives for developing complex and critical thinking arise from learning situations pupils are exposed to every day. The first condition for systematic developing of critical and complex thinking is therefore establishing appropriate circumstances - learning situations that demand the use of thinking processes and skills from pupils. For example the following thinking processes and skills should be elicited: comparison, classification, interfering, finding out the main ideas and characteristics, investigating and researching, making arguments, working with sources, presenting ideas, cooperation and critical judgment (ibid). Students can get a habit of approaching a problem by confronting themselves with open problem situations or the so called unstructured problems and by preparing the conditions in which different aspects of problems have to be treated and empathy and imagination must be used.

For example, critical thinking should be provoked in the following situations:

- by confronting, arguing and exchanging different views and referential frames;

- by searching for clear arguments for one's own statements and for claiming, when we have support;
- through searching for valid and reliable sources;
- at treating situation in its whole complexity;
- through searching for alternatives;
- in the situations that demand openness and exactness;
- in situations that demand sensitivity and appreciating others' arguments ... (Ennis, in Baron and Sternberg, 1987: 9-37).

Very important for the developing of critical thinking is also the stimulation of metacognition and auto-reflexiveness. Students are stimulated to reason about clearness and comprehensibility of their findings and inferences, about the sources they have used, about the logical aspect of their arguments, about various aspects of the problem and different views on their solving. Also the activities that demand the suppositions analysis, presuppositions, stereotypes and other biases and self-evidence should be included.

The convenient methods for stimulating critical thinking are different sorts of discussion groups, round tables, role playing, text analysis, commentary and other materials and especially a debate.

And exactly the debate or widely said – learning of constructing and deconstructing arguments – has a very important role not only for developing critical thinking but also for developing complex thinking at all. Many studies namely show us that the debate effects are not limited only to the skills of arguing and debating but also show the transformative nature of the debate and its potential for preparing students to approach problems (not only in the situation of debate).

This is affirmed also with the Snider's and Scnurer's introduction in the book, dedicated to the debate, which doesn't legitimate the debate as an academic discourse or »added value« but as »a method of learning, which encourages investigating of (new) ideas«. Shuster (2006) shows how to use this method for literacy strengthening of underprivileged: with well organised network of debate circles for hundreds of students from vocational education (who are weak at school work) who were captured and equipped with debate skills which have well influenced not only their cognitive skills, but have also contributed to their personal development and wellbeing.

Theoretical context of developing complex and critical thinking

In spite of the proved effectiveness of separate methods of active learning it would be too short to arise only from concrete forms and methods of work for developing complex and critical thinking. Developing complex and critical thinking should be posed in a wider context dealing with knowledge and learning. And concrete forms and methods can be a helpful tool in this way.

In the broadest sense we could say that for the approach that is focused on developing complex and critical thinking, the learning process is characteristic, that it builds on the students' activity: students construct their comprehension through investigation and experiencing, including various thinking processes and skills.

Many investigations from the last years have affirmed that the durability and usefulness of the knowledge that is acquired in an active mode (by systematic stimulating students' thinking activity) is bigger than the knowledge adopted only from others. For example, it was established (according to Bransford et al., 2000), that students, who have investigated actively the historical sources, were more successful at the analysis of new, not known before, than the students who hadn't got such experience and gave a complaint, that it hadn't been thought at school. Similar findings were obtained for the use of active methods in physics and geometry (ibid.).

It was also shown that it is reasonable to round up the process and the investigative approach with systematic resuming of the wholeness, unless the knowledge obtained from the partial experiences is threatened not to reach the level of generalisation. The biggest durability was therefore shown at approaches where the investigation, research and other various activities were combined with teachers' explanation and work with textbooks.

Cognitive psychologists have established that the active approach, founded in learner's own investigation and knowledge building (with the help of different activities, processes and procedures), relieve the interiorisation of concepts, principles and rules. By all this, also the durability of knowledge and the capacity using it in new circumstances is established. Knowledge, based in learner's own experience, supported by all the phases of the learning process, which they are passing, and which has much more clinging points of retrieving or using it as a knowledge, we only adopt by others (More about this in Rutar, 2003: 28–32).

It is, of course, not meant that nothing can be lectured or that the method of explanation is wrong. On the contrary! For many occasions it is quite an appropriate mode; it is even the most effective way for some of them (especially in connection with the structured discussion). There is also no need to acquire all the knowledge by exploration. But nevertheless, there are many more opportunities where learning by discovery is almost as appropriate as the lectures or even better than we usually think and see.

In our school context we have tried to stimulate the approach that is based on the students' active role in the frame of curriculum reform (and many projects that accompany it). This was namely based on the learning objectives and developmental process approach. The learning objectives approach has brought a shift from content orientation to process or activity orientation.

The stress on learning objectives instead of former contents doesn't mean neglecting or even excluding contents or putting them into the second plan. But it means new emphasis in connection with the contents. Contents are not the exclusive guide for learning process any more, it is also important how these contents are gained and how students treat them – what are they capable of doing with them, in which way do they »process« them: compare and classify, infer, find out characteristics, research, conclude, argue and present ... In the heart of the learning objective approach lies a connection of contents with activities. This puts content in the exclusive connection with concrete mind processes. This contributes to the active acquiring or better said – »building« of knowledge in the process and with the help of the processes. At the same time also the thinking processes and skills – broadly said: complex thinking – are improved.

Anyway, the care for complex and critical thinking is not finished with the use of thinking processes and skills. Both are namely evaluated through the final result, i.e. the capacity of conceptual understanding.

Students are often able to think »about« different concepts and procedures but not »with them« or with their help, which means in such a way that they are used. Also the managing of thinking processes and skills remains only on the level of good art, if it doesn't contribute to »the transforming facts and procedures that they are able to describe and think in the useful conceptual tools« (Cit. Bransford, Sherwood, Sturdevan, 1987: 172). It is very important how to guide pupils to the understanding of how concepts and procedures can function as a tool for problem solving or how they help in conceptualisation of events and phenomena in new

and unrecognised ways (ibid.). Namely, neither the knowing of concepts nor the pure managing of thinking processes assure the development of »conceptual applicability« (ibid.: 174).

Pupils should be helped by organising knowledge in models which are used by experts to solve problems and then train them of similar strategies (ibid). It is not only the question of gaining pure skills and problem solving strategies, but connecting both with the content knowledge in the context of problem solving, and everything together with the aim to develop conceptual understanding or competent knowledge use.

Learning by understanding is constituted of discovering key concepts and connections with other already learned concepts. It is very important to actively elaborate and seek for the connections. Or, as it is established by Resnick, the transfer learning doesn't happen spontaneously - it comes from intentional efforts: to find out connections between elements of knowledge, to develop explanations and arguments and to pose new questions (1989).

The development of complex thinking is therefore guaranteed only by the dialectic connection of contents, gained with the use of thinking processes, stimulated with active methods of work and pushed on to the conceptual level.

The level of schools – what pedagogy of empowerment has in common with the stimulating complex and critical thinking

The experiences we have with our support to teachers in developmental and innovative projects show that the manoeuvring space for their professional growth is large. Many teachers found in consultations with colleagues and materials a lot of inspiration to change their work in developmental challenge. In such a way they become longlife learners and creators of their professional development. And some of them achieve quite persuasive effects in their environments.

However, also the most engaged teachers clash against at least two obstacles: one is the scepticism of their own colleagues or even their open resistance, and the other one refers to systematic level (curriculum materials, norms, working circumstances ...).

In this chapter we will therefore try to think how to transfer the implementation of the projects from the individual level to the school

one. Finally, in the concluding chapter we will try to consider about the broadest frame for the introduction if the change.

As already mentioned, each teacher can do a lot – in his subject. But even very professional teachers who are also didactically skilful are less effective if their acting is not situated in the wider context of development and changes not inclined to school climate. The effects of their efforts are limited if pupils don't experience the changes which are introduced in broader context. That means, if these changes are not the prevailing part of their everyday school experience.

In the case of such isolated trials, students can accept such an engaged teacher benevolently, because he gets out of the mediocrity. Students can take him as an identification model or – on the epistemological level – as a model for their own construction of knowledge and the attitude to it. Anyway, some statements from teachers in the context of evaluation show that pupils can be benevolent to such efforts, but many can experience such teachers and their stimulating to thinking as a »disturbance« that distracts them in their established routines. To research, to do with sources ... - to be engaged still during lessons, caught between overloaded schedules, plenty of tests and fixed hours of five or six subjects a day can be an additional effort for students.

Experience from our projects shows that the effects are the largest, when the project is led on the level of the whole team or with the whole team. Of course it is not the same if the incentive for the project comes from teachers themselves or if the external experts and institutions are the ones who offer the project.

But also in the cases when the external institutions are the initiators, good effects can be expected in certain circumstances. In this case it is especially important that we convince teachers first that it is worth making the efforts for changes. Then we should link our concept to their expectations, which are awarded in the process of analysis of their needs (SWOT). In the continuation teachers should be included in the jointed project planning and self directing development to experience the ownership of the project as much as possible, and to take responsibility for it and engage intensively in it.

In such cases we talk about auto regulative concept or about the concept of introducing changes »from bottom up«. The stress in this concept is on the transfer of power and responsibility for the project to schools and teachers themselves. External partners are only changing

agents but the source of the main power is installed within school as a collegial working environment and learning community.

For the learning community it is characteristic that it establishes more space for the professional development than for everybody caring only for himself. At the same time it stimulates auto reflection and active role of teachers in the community and in the society. In the climate of cooperation, confidence and reciprocal support, teachers come to the awareness of their feelings about themselves, as a human and a professional; they learn to cooperate in different interaction processes to understand group dynamic and to analyse their own acting. They often succeed to pose their fixed concepts and practices under question.

On such basis teachers can jointly plot long-term projects that include personal plans on their own professional development as well as developmental plans of the activity of the whole school. Schools take more incentive for their own development: they identify problems, which they would like to solve more systematically; they establish priorities, make plans and form strategies for evaluation and self-evaluation. The care for your own development is not a signal of weakness that should stigmatise you, but one of the most important quality assurances.

Forming schools into learning and cooperative communities is a part of a wider cooperative culture that is called new teachers' interactive professionalism by Hargreves (1994: 43). It is characterised by culture of cooperation and consultation and by replacing hierarchies and external control with team approach and strategies of self-evaluation. Communities are more and more systematically oriented from accidental intuitive self survival strategies to gaining the feeling of »I can«. In this sense we talk about empowerment.

Introducing any changes has more chances for success if it is supported with strategic action of the whole school. That is especially true for the stimulating complex and critical thinking. It is much harder to stimulate them by training only isolate skills in »laboratory« circumstances at only one subject without context. To be ironic: pupils can learn critical thinking only at history, for example with the help of debate method. But the chances for the developing critical thinking as a general attitude are much fewer, if the only chance pupils have, is at history, as if the whole school decides that it will systematically develop critical thinking and that each teacher will make efforts in this direction in the context of common strategy.

Critical pedagogy: broader context of considering criticism

We have already shown that complex thinking can be conceptualised as a strategic use of different thinking processes and skills. We have stressed that active methods contribute much to their use. To avoid the possibility of pure training of various thinking processes and skills the complex and critical thinking should be posed in the context of knowledge building and conceptual understanding.

We have also made a warning that – in spite of efforts of some teachers – it is much more effective if the stimulative learning environment is guaranteed by the whole school. In such a way schools become learning communities and contribute to their own autoregulation and selfregulation learning of their pupils.

But also in such cases many difficulties and borders are met. Some are transparent – for example oversized norms, segmented schedule, rigid disciplinary frames, external systems of control and similar. It is obvious that these should be challenged together with the efforts for the innovative projects. But some are parts of the hidden curriculum, which is a constitutive part of all schooling and here we shall pay some attention to this aspect.

Until the sixties schooling was treated as doubtless positive – as a tool for enlightening and socialisation and acculturation. But then authors appeared who were the part of the tradition of the so called sociology of education, who started to pay attention to various aspects of »social reproduction« function of schooling and education. Education is seen as consolidating and reproducing the established social and economic relations. The first who had seen the school as one of the key lever for the reproduction of existing social relations was Althusser, who has posed school as an ideological apparatus of state (1980).

Some authors dedicated their attention only to the mechanisms of control that can be read from the policy of schooling. But similarly important or even more so are the sophisticated and less evident mechanisms of their concrete actualising (for instance: the mechanisms of selection and knowledge structuring) and socialisation and subjectivisation effects of schooling.

Usually the curriculum and knowledge seem to be unquestionable. Education is treated as a cultural transmission and as a socialisation in skills and values. Teachers' task is to find the most effective ways of transferring these skills on to as many pupils as possible. Reforms can change

the way of their organisation, but the suppositions are not analysed. Also their self-evidency is not questioned.

The sociologists of education warn that education is a part of wider social process and should be considered in specific socioeconomic frames. On one side they focus on the link between schools and society and on the other on daily practices in classes that produce different meanings, burdens, values and connections. They investigate how specific meanings are constructed in schools and how class practices contribute to this. Each practice contributes different meanings and is determined with specific views we even aren't aware of, until we analyse them.

One of the most important authors of sociology of education is Bourdieu (1971) who links schools with the transmitting cultural capital. Individuals acquire their schooling not only by knowledge and literacy but also by different beliefs, problem approaches, methods ... A thinker is tied to his age with the screen of the prevailed actual problem approach in which he thinks and which was mediated to him by schooling. The frames of problem estimation which we are sunk through our entire schooling are one of the elementary dimensions of intellectual programming of society and the period.

Schooling therefore equips all individuals with »basic, deeply interiorised patterns of mastery« (ibid.: 193), which are the basis for gaining new ones. Gaining the system of patterns which organises the thinking of individuals depends on frequency they are used to and on the stage of consciousness and on how they act in specific circumstances.

»Patterns have got their second nature ..., manage and regulate mental processes without being consciously recognised and controlled. The thinker belongs to the society and to the period with all the cultural unconsciousness that belongs to his intellectual training ... The function of school is conscious and partly unconscious ... producing individuals who are equipped with the system of unconscious (deeply implanted) patterns of managing what constitutes the culture ... Each individual transfers unconsciously the common tendencies and those in which the period styles and thinking patterns are recognised, that organise reality with regulating and organising the thinking about reality ...« (ibid.: 193–194).

The schools equip pupils with the principles of knowledge and reality organisation, states Bourdieu. In the potentially undetermined cultural world - an un-differential chaotic school brings the system and order by the principle of differentiation and use. But schooling doesn't offer only referential points but offers the »methods and programmes of thinking«

(ibid.). With the usual schedule schools carry out and on which chronological order which seems natural and inevitable it is based, schools become alienated from the assurances of logic and teaching.

They establish hierarchies from the mass of works - for example with the selection of textbooks and summaries. Teachers plan teaching in accordance with the system of organisation that is then led by students when they learn and answer the questions.

Each type of teaching produces specific »products«. They can be differentiated by the nature of gained knowledge and by the way they are gained: by the examinations, that must be done, and by the nature of exercises they practice. All the practices of teaching suppose the »right« mode of intellectual activity, the »right« culture and the »correct« attitude to it.

We can talk about some kind of a symbolic violence. This concept interrupts the views and the concepts of the spontaneity of the pedagogical action, and warns against the monopoly of school system that affirms the symbolic violence as the state legitimates physical one (Bourdieu and Passeron, 1994). Symbolic violence is the form of social violence that removes from authoritative way of imposing; it gives up the most violent techniques of coercion, but instead of it forces favoured meanings. Pedagogical action is a symbolic violence whenever it succeeds to impose a kind of cultural arbitrariness. In such a way a pedagogic action reproduces the prevailing culture and contributes to the reproducing actual structures of power.

Pedagogic action demands also pedagogic work which can be seen in this context as a process of coercion that must last long enough to form »right« habits through the training. These habits are a product of interiorised principles of cultural arbitrariness. Pedagogic work assures that a human reacts properly on the symbolic cue in all the circumstances.

Teachers must be well prepared for such a pedagogic work. The spirit of corporative capital shows itself in teachers' deskilling and reskilling. This is in the service of growth of the technical control and efforts for the functional utility - the topic, Apple and Beyer write about. As the only reaction against the expressions of domination the psycho-logistic patterns of life and choice have been developed. But here the problem solving is reduced to the individual level by those and the problematic social relations are not problematised by them.

Teachers are trained in this perspective in such a way that they accept the prevailing teachers' roles, expectations and characteristics. They are equipped by skills, dispositions and competencies, with the already made

solutions of problems, which are needed for the reproduction of the prevailing school practice. Everything that is not directly useful counts as dysfunctional. The efforts for maximising learning achievements, maintaining order and discipline and offering the meaningful learning experiences are prevailing. Intellectual challenges and problems, creating new knowledge and looking for truth are considered to be unpractical and academic.

The applicative approach to curriculum and to teaching is marked by measuring competences which should be as measurable as possible. Instead of questioning, analysing and reflection, technical, measurable, specific training of separated skills prevails. Behind all this is of course the care for educating conformed and well qualified citizens – workers, which will serve the demand for increasing productivity.

Some of sociologists of education don't remain only at school criticism. They also try to offer the emancipatory perspective and they pose it directly in the context of teachers' practice.

For example, Beyer (1988) arises from the supposition that the necessary qualities of the individuals can develop only through the democratisation of the authoritarian structures – through the cooperation at life decisions in institutional and daily practices.

One of the modes to actualise this is the institute of schools as learning communities which we have talked about in the chapter before. At the same time it is very important to stimulate the teacher training for reflection – that they would be able to recognise concepts and suppositions which determine their everyday practices and for that they are usually not awarded.

Similar as Beyer also McLaren (1986) sees the opportunities for opening school space in teachers themselves to find out solutions for their problems and situations.

He argues for resistance against changing routines into repressive and against reducing rituals on routines. Boring archaic rituals should be revitalised and new, more flexible, cooperative and interpersonal class cultures should be stimulated. More rituals that arise from students themselves should be confirmed. Students should be given an opportunity to plan their time and seek their own expressions. But the most important is to attribute them the capacity to reason and imagine and the reflection instead of passive role.

The common idea of all those incentives is similar to the ideas of the new social projects and forms of democracy, articulated recently by Michael Hardt and Antonio Negri (2000, 2004). These ideas and concepts

such as representation, freedom, autonomy, empowerment and independent life inside modern global networks of power relations and communication practices, are obviously the most powerful agencies in the process of social and political regulation of modern life. Contemporary shift from industrial toward postindustrial societies has been accompanied by the so called nonmaterial production of social relations, communication practices, feelings, emotions, ideas etc. We can name this production as a biopolitical production. This biopolitical production profoundly influences many aspects of our lives – and the effects are not always good or pleasant, because they serve to powerful international corporations with their systems of propaganda and are driven by the logic of profit (Rutar, 2006)

The alternative is offered by the concept of multitude. Multitude is an open network of singularities, which are mutually connected on the basis of their own produced goods and not on the basis of the logic of profit, power relations, hierarchy and exploitation. The multitude is an ultimate space where people can really develop solidarity, mutual cooperation and logic of shared production which would be not dependent on propaganda and popcultural mass media. There are many different and open movements and creative groups around the world that are able to revolutionize the ways how everyday people understand the world, work and live inside it and think about it. And teachers are the ones who could contribute to the production of the new culture of conversation, cooperation and mutual problem solving.

Of course it remains an open question of how is it structurally possible for schools to become such special free places where people can seriously talk to each other, freely choosing themes and issues or topics and learning the culture of conversation which includes many different skills (how to listen, offer arguments, discuss, interpret, argue, protest, express your own opinion, demonstrate etc.). Is it really possible for any institutionalised place to offer really new opportunities which will enable different people to express their opinions, talk about themselves, social relations, society, politics, art, science, teach themselves how to think and operate?

We should namely be aware of the fact, that although school space is being opened, many things depend not only on democratic awareness and efforts of all involved. They also depend on conflict between hidden hegemonistic incentives and efforts for domination and control, built in the system and everyday practice on one side and emancipatory incentives on the other.

Therefore continuous and strict reflexive attitude and theoretical enlightening of concepts and suppositions on work are indispensable in schools. This holds also for the school practices, which seem undoubtedly advanced. In the first place this is true exactly for the stimulation of complex and critical thinking. Namely both of them refer to the most demanding thinking activities still in their names. The stimulation of criticism and complexity of thinking shall remain on the half of its way if it is not posed in the context of questioning of your own conceptual frames and suppositions and analysing effects both, on the side of teachers as well as on the side of pupils. Unless it happens that we remain in the frames of proficient training of thinking processes and skills – but critical and complex thinking is nevertheless not developed by this! Even worse: student training for definite skills (although for such fine activities as for example a debate is) can remain without the analysis of suppositions and efforts of one's own activity and without posing a question on the wholeness of social relations in the last phase on only one brilliant mechanism for conforming young people to the concurrency in the profit battle for the survival. And nothing more!

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