

METACOGNITION AND CRITICAL THINKING: HOW TEACHERS CAN ENHANCE METACOGNITION AND CRITICAL THINKING IN THEIR STUDENTS

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What is metacognition?

The concept of metacognition is one of the most important achievements in the contemporary studies of thinking. In the broadest sense it refers to thinking about our own thinking and/or knowledge about thinking.

The distinction between declarative and procedural knowledge has its parallel also on the field of metacognition. Metacognitive knowledge can be content in its nature and refers to knowledge about thinking (knowing-what) or it can be a process in its nature and refers to ability to self-control or self-monitor our own thinking (process, strategies, knowing-how-and-when to use knowledge; ability to use knowledge about thinking) (Kuhn, 2000; Roberts and Erdos, 1993).

One of the first researchers of metacognition, Flavell, defines this concept as »one's knowledge concerning one's own cognitive processes and products or anything related to them ... Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes ... usually in the service of some concrete goal or objective.« (acc. to Marzano et al., 1988: 9) The metacognitive thinker, thus, reflects his/her own flow of thought, raises awareness about the process and the content of thinking and also about the influential factors, such as emotions, socio-cultural circumstances and others. At the same time he or she systematically plans and monitors his thinking. Flavell distinguishes between metacognitive knowledge, metacognitive experience, metacognitive goals and metacognitive strategies (Brown 1984, also in Juliebo et al., 1998). *Metacognitive knowledge* consists of

knowledge and beliefs about factors influencing problem solving process and cognitive outcome:

- a. Knowledge of personal factors or characteristic of a problem solver that affect the result of intellectual activity, for example, knowledge about reading strategies and the insight in one's own preferences in applying reading strategies.
- b. Task knowledge involves information available about the task, for example awareness of the type of the problem (whether problems are well structured or not) or how difficult they are.
- c. Strategy knowledge refers to awareness about efficient strategies in the situation solving a specific problem.

Metacognitive experiences refer to evaluation and monitoring of cognitive processes in problem solving situation. Metacognitive goals are objectives of a metacognitive exercise, for example consciously monitoring thinking process to estimate its effectiveness. Metacognitive strategies refer to different kinds of self-evaluation and self-monitoring, for example, skimming a text to estimate its difficulty.

Self-control and self-monitoring is the central characteristic of metacognition also through the lenses of many other authorities from this field. Marzano (1988: 9) says: »Metacognition is being aware of our thinking as we perform specific tasks and then using this awareness to control what we are doing,« Baker and Brown (1984, acc. to Maqsud 1997: 387) define metacognition as: »The knowledge and control a child has over his or her own thinking and learning activities, including reading,« Costa (1984: 57) explains metacognition as »ability to know what we know and what we don't know,« and Martinez (2006: 696) explains: »Metacognition is the monitoring and control of thought,« and the latter also: »It can be seen as evaluation turned inward, especially turned toward our ideas« (ibid: 698).

New dimension of the concept of metacognition is seen in work of Nelson, Jost and Kruglanski (1988: 70). These authors define metacognition as: »inferences that are drawn about the mental states of others as well as inferences about one's own mental states.« They broaden focus from self to others, also. All thinking, not just our own, and all knowledge about thinking is involved in the concept of metacognition. Metacognition is also knowledge about knowledge, for example insight and understanding of principles from the field of epistemology, cognitive psychology,

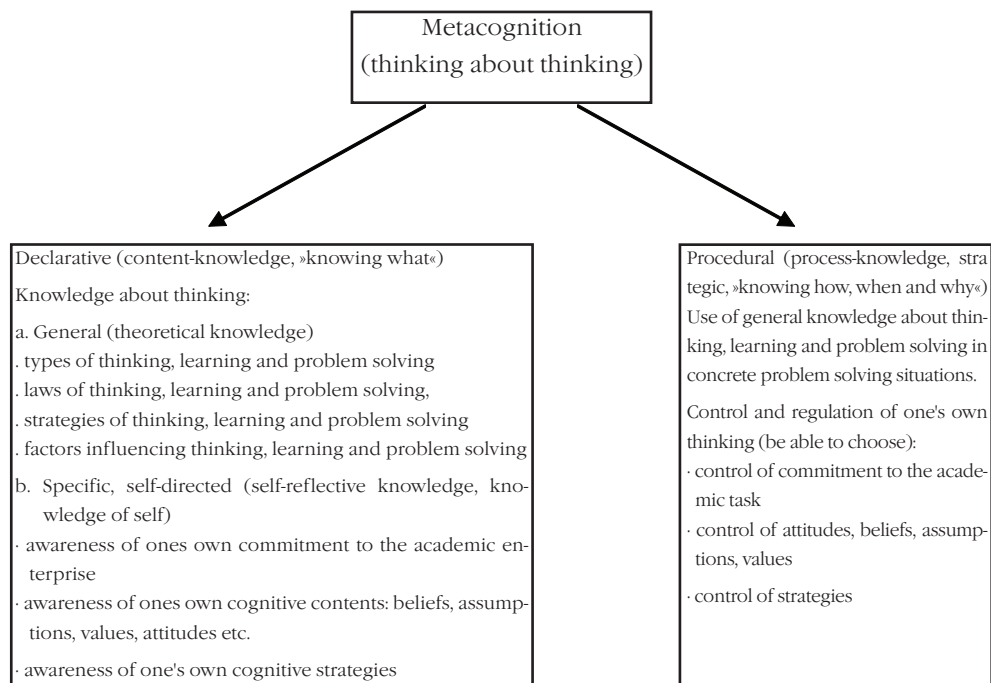
philosophy, linguistics and other scientific disciplines, dealing with thinking. Knowledge one has about his own thinking and about thinking of others is more or less differentiated, systematic and complex. Similar to these authors, also Kuhn and Dean (2004: 270) argue that »broader understanding of thinking and knowledge« is the basic element of the concept of metacognition and it develops in its complexity and differentiation, as the different aspect of self-knowledge.

Other authors, as Flavell, also differentiate the various components of metacognition. Most of them mention two groups of activities, but give them different names: a. knowing about cognitive resources and b. self-regulation of thinking (McLain et al., 1991; acc. to Masqud 1997). Similarly, Paris and Winograd (acc. to Marzano, 1988) claim that metacognition involves two primary aspects: a. knowledge and control of self and b. knowledge and control of processes. The knowledge and control of self involves student's ability to choose commitment to academic task, to choose some healthy attitudes concerning learning and problem solving behavior, such as »be persistent«, »learn from failure« etc. and to monitor and control attention. Knowledge and control of processes refer to student's knowing what facts and concepts are necessary for the task (debate, problem solving etc.), which strategies, heuristics or procedures are appropriate and how to apply the selected strategy, procedure and heuristics. But these three types of knowledge are not enough. A student should maintain executive control in the task and this involves evaluation (assessing our current knowledge state), planning (selecting strategies to fulfill specific goals) and regulation (checking his progress).

If we make a synthesis of all these views, we can say that metacognition is knowledge about thinking that consists of:

- a. declarative knowledge about thinking, comprising general knowledge types, processes and laws of thinking (epistemic, knowledge of thinking) and knowing and awareness about his/her own thinking processes and contents (beliefs, assumptions, values, attitudes; self-reflective knowledge) and
- b. procedural knowledge about thinking that refers to ability to use general knowledge about thinking of the concrete problem solving situations and the ability to regulate and monitor our own thinking processes in specific situations.

Synthetic definition illustrates the following scheme:

Figure 1: Components of metacognition - synthesis of different views

Metacognition – important element of critical thinking

There is no one single definition of critical thinking. The concept of critical thinking has many similar defining features, but at the same time there are also differences in defining this term among theoreticians from this field. Most frequently the concept of critical thinking refers to (Rupnik Vec and Kompare, 2006: 27):

- analysis and evaluation of argument (Ennis, 1985; Halpern 1996; Kuhn and Dean, 2004),
- analysis of different viewpoints (Brookfield, 1995; Paul and Elder, 2001),
- judging of alternatives, solutions, evidence (Halpern, 1996; Sternberg, 2004),
- analysis of assumptions (Ennis, 1985; Brookfield, 1995; Wade, 1995; Paul and Elder, 2001),

- judging on the basis of criteria (Lipman, 1988, 1991; Halpern, 1996; Paul and Elder, 2001; Petress, 2004),
- self-reflection and metacognition (Norris, 1985; Lipman, 1988, 1991; Facione et al., 1990; Halpern, 1996, 1999; Paul and Elder, 2001; Petress, 2004; Kuhn and Dean, 2004; Martinez, 2006).

In this article we focus on self-reflectivity and metacognition as one of the defining features of critical thinking and define the latter with Deanna Kuhn's words as »awareness of one's own thinking and reflection on the thinking of self and others as an object of cognition.« (Kuhn and Dean, 2004: 270).

Theoreticians of critical thinking do not use the concept of metacognition. But they »speak and think« about it with other words. Lipman (1988: 39), for example, defines critical thinking as »skillful, responsible thinking that facilitates good judgement because it (1) relies upon criteria, (2) is self-correcting, and (3) is sensitive to context.« He mentions self-correction, and then, we presuppose self-reflection of one's thought as one of the four basic defining features of critical thinking. Critical thinking is – in the conceptual frame of this author – thinking that is self-developing and self-corrective on the basis of informed judgment and as such has to be self-focused.

In the work of Diane Halpern (1996: 5) metacognition is also mentioned: »Critical thinking involves evaluating the thinking process – the reasoning that went into the conclusion we have arrived at or the kinds of factors considered in making a decision.« In this working definition she conceptualized critical thinking very similar to Martinez's diction where metacognition is defined as self-evaluation of thinking (see in the first chapter of this article).

Brookfield (1995: 7-9) exposed »identifying and challenging assumptions, challenging the importance of context, trying to imagine and explore alternatives and reflective skepticism,« as defining features of critical thinking, so as Myers (2003, acc. to Petress 2004: 461): »Critical thinking examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions.« Recognizing fallacies in our thinking and listening is also emphasized in Myers' text. (Petress 2004: 461) Both definitions comprise metacognition as they suggest that critical thinking person strives to self-searching and self-questioning: What assumptions are there in the core of my thinking? Are these assumptions true? What

values direct my thinking and decision making? How can I prove that and how reliable is my proof?

The Delphi Report (Facione et al., 1990: 4) represents the consensual definition of critical thinking by sixty greatest authorities from the field of critical thinking. Metacognition as characteristic of critical thinking person is implicitly stated in this segment of the definition: »... self-regulation is also central to critical thinking.« Self-regulation consists of self-examination and self-correction, thus critical thinking is self-focused and it is directed at revealing and correction of one's own biases. Norris (1985: 44) argues similarly and says that an important characteristic of critical thinker is a critical spirit that »has three requirements: a. to employ critical thinking skills in reasoning about situations encountered in the world, b. critical thinking is turned upon itself and c. critical thinker has the disposition to act in accordance with the dictates of critical thought.«

Bailin, Case, Combs and Daniels (1999: 281) perceive the knowledge about thinking and quality thinking criteria and also the knowledge about principles and standards of argumentation as important elements of critical thinking: »We have argued that what characterizes thinking which is critical is the quality of the reasoning. Thus, in order to become a (more) critical thinker one must understand what constitutes quality reasoning, and have the commitments relevant to employing and seeking quality reasoning. The knowledge necessary for such understanding includes background knowledge relevant to the context in question, knowledge of principles and standards of argumentation and inquiry, both in general and in specialized areas, knowledge of critical concepts, and knowledge of relevant strategies and heuristics.« These authors put meta-knowledge in the centre of one's ability to think effectively and critically.

In this short review of definitions of critical thinking we can not overlook Paul et al. (1989: 61, 62).¹ These authors in various texts more or less directly expose metacognition as a characteristic feature of critical thinking. They mention (at least) two affective strategies used by critical thinking person that presuppose metacognition: »Exploring thoughts underlying feelings and feelings underlying thoughts,« and »Developing intellectual humility and suspending judgment.« These authors argue that raising awareness about relationship between thinking and emotion is of great importance to a critical thinker: In the basis of every thought there is some level of emotion and in the basis of every emotion there is some thought. Just with this insight a critical thinker is able to better understand herself/himself and others and is aware of her/his reaction as just

one among possible choices in the situations. It also depends on the interpretation of a situation. A self-understanding is the first step in the process of self-control and self-development. A teacher enables students to learn this skill if he directs them into reflection on core thoughts and emotional reactions of self and others.

The second strategy of a critical thinker that includes metacognition is »intellectual humility and suspending judgment.« A critical thinker knows the limits of his knowledge, he searches for his own biases, stereotypes and prejudices. He strives to get insight in his own beliefs: what is the evidence for his beliefs, how are they built, what further proof would he need etc. A critical thinker knows that he should avoid judgment until he has enough proof. All the time he reflects his reasoning through the lenses of a new knowledge.

On the basis of the review of mentioned authorities from the field of critical thinking we can conclude that there is a consensus about self-directed, self-regulated and self-checking, thus, metacognitive nature of critical thinking.

The metacognition relates explicitly to critical thinking according to three authors. Kuhn and Dean (2004: 270) call attention to diversity of the concepts of critical thinking in their essay on relationship between cognitive psychology and educational practice. But nevertheless »one non-controversial claim we can make about critical thinking, is that it entails awareness of one's own thinking and reflection on the thinking of self and others as an object of cognition.« Metacognition, the concept used by critical thinking theoreticians, is defined in quite similar way.

The third author that argues about the relationship between metacognition and critical thinking is Martinez (2006). He identifies three basic categories of metacognition: a. metamemory and meta-understanding, b. problem solving and c. critical thinking. According to Martinez critical thinking is one of the important areas of metacognition.

As mentioned before, authors from the field of critical thinking neither use the word metacognition, nor argue about some questions about the role of metacognition in critical thinking which we comprehend as crucial: What knowledge (what concepts) from the field of thinking a critical thinker should have to better understand himself and his thinking processes that would enable him to control and monitor his thinking effectively?

Conceptual tools for enhancing meta-cognitive thinking and the development of self-understanding

How to teach critical (effective) thinking effectively is one of the basic questions in education. Ennis (Plath et al. 1999: 208) classifies the various approaches to the teaching of critical thinking skills as either 'general', 'infusion', immersion' or 'mixed':

- The *general approach* is where critical thinking principles are taught in a separate instructional unit.
- The *infusion approach* is where students are encouraged to think critically on the subject and in which principles of critical thinking are made explicit.
- The *immersion approach* is similar to the infusion approach except that the principles of critical thinking are not made explicit.
- The *mixed approach* is one where a combination of the general approach with either the infusion or the immersion approach is applied.

The other three strategies presuppose teaching critical thinking inside scientific disciplines, inside school subjects. They differentiate from each other in degree to which the aim of learning critical thinking is transparent to the pupils. In the cognitive psychology terminology they differentiate in the degree of metacognitive training. The author of this article endeavors that teaching of critical thinking with infusion or for mixed approach (separate plus infusion) should be practised. Both approaches include the development and training of metacognitive thinking within the general aim of critical thinking development. Learning of skills (even metacognitive and critical thinking skills) is more effective if the objectives concerning these skills are stated clearly and if pupils are consciously trying to achieve them.

It is very important that a teacher adapts the transparency of critical thinking principles to children according to their developmental stage. For example immersion approach is enough for secondary school children, when a teacher teaches of qualifiers. But the same children can think about the definition of reasoning, about qualities of good reasoning and can engage in self-evaluation of reasoning (metacognitive thinking) in concrete problem solving situations. The breath, the depth and the

transparency of critical thinking principles is one of the most important decisions of a teacher in planning to teach for critical thinking.

So we argue for systematic *teaching for critical thinking* at the same time as *teaching about critical thinking*, as we interpret Ennis's concept of teaching with infusion. Two groups of relevant questions are set up:

- Questions concerning critical thinking teaching strategies, for example: What are effective strategies of *teaching for critical thinking* inside school subjects? What kind of instructional technic should teacher use to engage students in critical consideration of contents? What are effective strategies for *teaching about critical thinking*? How should a teacher effectively combine teaching for critical thinking with teaching about critical thinking?
- Questions concerning contents of teaching for critical thinking: What issues are the most suitable for critical evaluation?² What contents (concepts, models, principles) about critical thinking (in the meta-knowledge sense) should be handled to enable learners more effective self-reflection and more effective metacognition?

In the following section of this article we focus on the last questions from these groups: What knowledge about thinking makes a student more efficient in metacognition? What are effective strategies to enhance metacognitive thinking in students, which in turn makes students think about the quality of their thinking? Let us see what the answers to those questions of some theoreticians are.

Kuhn and Dean (2004) mention two general strategies of metacognitive development:

- Encouraging student's self-reflection and self-evaluation,
- Encouraging interiorization with continuous exposition to critical questions.

The former refers to a teacher's stimulation of students thinking with questions like: Why are we doing that? What have we got to do with this? How effectively are we doing that? The latter strategy implies questions like: How do I know that? What is my evidence for this claim? These suggestions are based on assumption that continuous exposition to such questions leads to interiorization of these structures, which can then be used also in other, not just learning, situations.

Continuous exposure to metacognitive tasks is one of the basic strategies of teaching and learning also for Martinez (2006). Metacognitive development should be, from the perspective of this author, explicit learning goal for both, a teacher and a student. A student will perceive the metacognitive development as important learning goal only if he or she understands the role of metacognition in intellectual enterprise (problem solving, decision making, argumentation, debating etc.)

Another two strategies are mentioned in Martinez's text (2006): modelling and social interaction. A teacher could and should model metacognitive thinking during the problem solving and argumentation. Cognitive processes that are frequently exposed are interiorized. Social interaction during the joint problem solving is a good opportunity for metacognitive training. In dialogs pupils' ideas become clearer, their strategies become more explicit and they are shared among them. That represents an opportunity to model each other their cognitive and metacognitive skills.

Costa (1984) describes the following strategies of metacognitive training that can be used by teachers of all subjects with children of all ages:

- *Planning strategy.* A teacher directs a student to plan his cognitive activity in the context of time constraints or other rules under which a student must operate. Explicit guidelines concerning time, strategies and steps in problem solving process help students keep this all in mind and evaluate their performance afterwards. During the activity a teacher invites students to share their thoughts, progress and perceptions of their own behavior. After the learning activity a teacher can invite students to evaluate how well the rules were obeyed, how successful the strategies were or whether alternative strategies could be used.
- *Generating questions.* It is useful for students to put questions themselves. This self-generation of questions raises motivation and facilitates deep learning.
- *Choosing consciously.* Teachers can promote metacognition by helping students explore the consequences of their choices, thus teaching them to understand the relationships among their choice, their actions and the results they achieved.

- *Evaluating with multiple criteria.* Teachers can enhance metacognitive thinking by inviting students to reflect upon and categorize their actions according to two or more sets of evaluative criteria.
- *Taking credit.* Teachers could invite students to recognize what they have done well by asking a question: »What have you done that you are proud of?« He can stimulate students to seek feedback from their peers and teach them to give constructive feedback information. So students will become more conscious of their own behavior.
- *Outlawing »I can't«.* A teacher shall not allow students to use excuses such as »I can't«, »I don't know how ...«, »I'm not able to ...« and has to tell them this loud and clear. Instead, students should be encouraged to identify what information is required, what skills are needed and how to learn these skills. Students should be encouraged to persist in difficult situations.
- *Paraphrasing or reflecting back student's ideas.* This causes students to listen better to their own ideas, to clarify them or to extend them. It is useful also to invite students to paraphrase, restate, translate and compare with each other ideas because this is an excellent exercise in listening to others and to themselves as well.
- *Labeling students' behaviors.* This enables students to become conscious of their own cognitive processes and/or other behaviors.
- *Clarifying students' terminology.* Students often use hollow, vague and nonspecific terminology. When a teacher asks clarifying questions she or he causes students to explore their thinking in depth: to operationally define their terminology and to examine potentially hidden assumptions on which their thinking is based.
- *Role playing and simulations.* Taking on another role contributes to seeing things from somebody else's perspective and to the reduction of ego-centered perceptions.
- *Journal keeping.* Writing and illustrating a diary is an experience that provides an opportunity to relive such experience, to synthesize thoughts and actions, to revisit initial perceptions, to compare changes in those perceptions with the addition to new data, to identify blind alleys and to recall the successes and the tragedies of experimentation.

- Modeling is probably the most influential technique of all suggested before. A teacher models metacognitive skills when she: shares her planning, admits that to error is human and then shows remedy for it, admits she doesn't know the answer but she designs ways to find it, seeks feedback and evaluation from students etc.

In further text we explore the question: Which knowledge about thinking (concepts, models, principles) would enable students better self-insight and self-understanding and thereby to facilitate and direct metacognition? From our perspective these are some possible strategies:

1. *Invite students into process of exploring the concept of critical thinking and metacognitive thinking (as an important element of critical thinking).*

To judge effectively the quality of one's own thinking and the thinking of others one has to have a clear idea of what critical and metacognitive thinking is, what effective thinking is or what standards of good thinking are, what critical thinking skills are and so on. Different strategies could be used from a teacher to enhance these concepts formation in their students. One can be very simple: ask students to identify characteristics or skills of a critical thinker and then invite your students to compare their (naive) answers (pre-concepts) with one of theoretical models (for example Wade's model, Wade, 1995). So students will form clear idea of what critical thinking, critical thinking skills and metacognition are. These concepts will serve as criteria and will enable them to compare themselves with an ideal and to identify their own strengths and weaknesses concerning critical thinking.

2. *Enable students to make sense of learning critical and metacognitive thinking in the context of concrete science and in life and thus, to enhance their motivation to learn critical thinking.*

What are the benefits of a critical thinking person? In which situations is it especially important to think critically and make informed choice? What can we 'lose' if we don't think critically? What are the consequences of uncritical decisions? Could critical thinking be fun? How can critical thinking enable you to reach important goals? All these are questions that invite students to explore importance and consequences of critical vs. uncritical thinking and decision making. Through this exploration students will make sense of thinking critically.

3. *Enable students to articulate a very clear and simple goal concerning learning of critical and metacognitive thinking.*

Learning is more effective if students try to reach clearly stated learning goals. It's important for a teacher not just to set up the learning goals for students but to invite them to set them up for themselves instead. This is especially important for process learning goals, such as communication skills, self-reflection and metacognitive skills, critical thinking skills. A teacher can at the beginning of school year invite students to clarify the concepts of critical thinking, metacognitive thinking and critical thinking skills and then they articulate clear goals concerning the development of different critical thinking skills jointly. Through the year, it is important that the teacher gives students a lot of opportunities to learn these skills and directs and supports them in their evaluations of their progress (metacognitive thinking).

4. *Teaching students to differentiate facts and interpretations.*

A lot of students mix facts and interpretations of these facts. So the distinguishing between facts and interpretations is one of the most important goals concerning critical thinking. There are different strategies available. Here is an example: a teacher invites students to reply to the question: »Look at this picture. What is going on? What's the behavior of actors?« Students give their ideas and then the teacher causes them to distinguish facts-answers and interpretation-answers. One of the key questions students should learn to continuously ask themselves is: »How do I know this?« or »What is in this situation true?« »What proof do I have for believing this?«

5. *Enable students to understand the role and the influence of beliefs, assumptions, attitudes, values, prejudices and expectations on perception, emotion, thinking and behavior.*

One who understands the role of assumptions and beliefs in one's thinking, feeling and acting is aware of determinism of his own functioning with his cognitive structures. The student who understands also that his perceptions and thinking are framed with cognitive and social and emotional factors, understands that his actual perceptions and cognitions are directed and possibly biased with his assumptions and beliefs also. And he understands that these beliefs are sometimes explicit and even more often they are tacit, hidden, unaware and are taken for

granted. Awareness of this determinism on theoretical as well as on empirical level makes sense of metacognitive enterprise.

Different strategies are available to raise awareness of hidden assumptions which influence thinking. A teacher can introduce some of the models to students which explain influence of assumptions on reasoning and feeling and behaviour in general. Then he/she can invite them to self reflection and metacognition through the lenses of this model. Suitable models that can be used are ORJI cycle (Schein, 1988) or the ladder of inference (Senge, 2000). It is important that these models are presented in an attractive and the simplest possible way.

6. *Enable students to learn key concepts (infusion approach to teaching critical thinking), for example: assumption, perspective, critical questions, high-order questions, clarity in the use of language, intellectual standards, arguments, premises, conclusions, biases in argumentation, facts, interpretations, strategies of problem solving, heuristics etc.*

A systematic formation of the conceptual frame of critical thinking is - from our perspective - one of the most important priorities in teaching for critical thinking. It is important to teach critical thinking together with teaching about thinking. Two general strategies are available: a. a teacher introduces the concept to students and then invites them to use it systematically, and b. students use the (pre)concept without the clear awareness, a teacher names the process and that leads students to become conscious of using it, then a teacher invites them to explore the process or concept in depth and use it systematically in new learning and real life contexts.

These are steps in the first strategy: a. introduction of concept and/or skill, b. exploration of this concept/skill through different exercises, c. articulation of a clear goal concerning this concept use/skill training, d. using/training of the new concept/skill, e. metacognition and self-reflection in every problem situation, f. systematic checking of one's own progress. The other strategy is slightly different from the very beginning (teaching by immersion approach): a. problem solving and spontaneous use of some (pre)concepts and skills, b. raising awareness and naming of those skills. Other steps are exactly the same (teaching by infusion approach).³

7. *Enable students to understand in depth the relationship between thinking, emotions and behaviour.*

Paul et al. (1989) suggest teachers should frequently direct their students into analysis of the emotional responses and thoughts, that are in core of these emotions, of self and others. They can provoke this analysis with the questions as: How do I feel in this situation? How do I see (interpret) this situation? Can I see (interpret) this situation in a different way? How would I feel in this situation then? What are my conclusions? What is my evidence? What are my assumptions? How do others see the same situation? What are their conclusions about it? What is their evidence?

Another strategy presupposes the introduction of some theoretical model which explains the relationships between thoughts and feelings. Some possibilities we have mentioned before, another is Milivojević's circular emotional reaction model (Milivojević, 1999). When students are familiar with this model they can use it for the sake of better understanding of themselves and of others thinking and feeling in different situations in life.

8. *Enable students to practice metacognitive thinking: to plan, to act according to the plan and monitor the progress, to evaluate, to revise; direct students to reflection of their own thinking through the lenses of key concepts, models and principles from the field of critical thinking.*

Knowledge about thinking (concepts, models, principles) is just a conceptual tool students can use to think more systematically about their own thinking, feelings and behaviors. They direct their attention to different aspects of their internal processes and enable them to raise awareness about potentially hidden (unaware) aspects of their functioning, about thinking structures and processes in the first place (taken for granted assumptions, attitudes, values, preferred strategies of problem solving and decision making etc.), identification of their own strengths and weaknesses in the thinking area, to be proud of their strengths and to work on their weaknesses. So, teaching thinking together with teaching about thinking is from our perspective a powerful approach to enhance students' intellectual development.

Conclusion

In this text we investigate the concept of metacognition and the relationship between metacognitive and critical thinking and finally, we suggest some strategies to enhance both, metacognitive and critical

thinking. From the simplest definition of metacognition as thinking about one's own thinking we make – through the citation of the notions of metacognition of some theoreticians - a step forward to a more complex and deeper understanding of this phenomena. A synthesis of conceptualizations which serves as a frame for further investigations of relationship to critical thinking was made. We find out that metacognition is an important element of critical thinking and an important skill of a critical thinker. Finally we claim that the enhancement of metacognitive thinking is an important educational goal. We searched for principles of supporting and enhancing students' metacognitive development in literature and suggested some of our own ideas also.

Notes

- [1] Paul et al. (1989) identify 35 critical thinking strategies and categorize them into three groups: affective strategies, cognitive macro-strategies and cognitive micro-strategies.
- [2] Children should evaluate critically all issues they consider. Sometimes there is a lot of content to grasp and a teacher should decide which is the most important and should be investigated in the greatest depth.
- [3] Students' portfolio is a useful tool one can apply to systematically develop some skills and to check up one's own progress

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