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Self-regulated learning: Critical-realistic conceptualization

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Abstract

The paper deals with self-regulated learning from the perspective of critical-realistic philosophy. In this respect, it is focused on existing models of self-regulated learning, which it re-conceptualizes through the current categories of critical realism. We draw from the latest works by Bhaskar, Harré and Elder-Vass. Although there has recently been a relatively broad critique of methodology used to evaluate self-regulation, very little space has been devoted to epistemology and ontology. We believe that the criticism of the existing ontology and epistemology of self-regulated learning and its reconceptualization in the light of critical-realistic philosophy could contribute significantly to the development of a heuristics theory of self-regulated learning.

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1. Introduction

In today's rapidly evolving society, in a period of considerable progress and at the same time of many global challenges, modern society is increasingly aware of the indispensability of education. Education is thus seen as a means of promoting mutual understanding of oneself and others. In this context, the emerging debate about the requirement of a "learning society" is appropriate. In education it means a greater emphasis on the selection of information, active construction of knowledge, creativity, critical thinking, synthesis and generalization.

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The basic pillars of any educational society are to learn to know, learn to act and learn to live together. From this perspective, learning is understood in a broad sense, as an inner journey, learning about oneself and at the same time as the process of forming relationships with others. Such an understanding of education forms a common thread of all educational areas at any stage of a formal or informal educational setting and ultimately affects the whole of society.

The concept of lifelong learning generates the discussion on the quantity and quality of education. A question that should be raised is, *“What should students learn in schools? How should the acquisition of knowledge and the development of life skills be balanced?”* To answer this question we need to broaden our understanding of the value of knowledge. Its purpose is not only to remember specific information, ideas and facts but the search for a broader context, evaluation, analysis of ideas, and vice versa. In fact, there is a need to learn a new culture of learning, which will be characterized by greater individualization in the construction of knowledge and represented by a cooperative, independent and responsible learner.

A desirable outcome has been achieved over the past few decades under the term of self-regulated learning and is characterized as *“the processes whereby learners personally active and sustain cognitions, affects, and behaviors that are systematically oriented toward the attainment of personal goals”* (Zimmerman & Schunk, 2011). This phenomenon is the focal point of many scientific fields of psychological research, including research on metacognition, cognition, decision making, motivation, volition or problem solving. Each research community focuses on different aspects and content of the self-regulated learning process.

Furthermore, the research has informed educators about several models arising from the theoretical definitions of self-regulated learning and validated in practice on the basis of empirical research (see Boekaerts, 2002; Borkowski, 1996; Pintrich, 1999; Winne, 1995; Zimmerman, 2002, 2005). However, there is no basic model of self-regulated learning demonstrating adequate validity and reliability. All views agree that achieving higher levels of self-regulation is a characteristic of successful students. The development of these specific strategies helps students assess their own learning, control their own understanding and if necessary correct errors, which in turn provides an important stimulus for the development of the internal potential of students. In this respect, we focused on existing models of self-regulated learning and re-conceptualize it through the current categories of critical realism.

2. Models of self-regulated learning

Based on various theories (the phenomenological perspective, the constructivist concept, the will theory, the socio-cognitive theory, etc.) various models of self-regulated learning have been designed offering several definitions and concepts. Authors interpret self-regulated learning a particular theory, which assumes the highest level of importance in explaining the process of self-regulated learning. For example, the constructivist school focuses on activities that evoke mental operations, create and change cognitive structures based on the experience with which students come into the classroom. Traditionally, the teacher takes the lead role. Instead of a directive, manipulative or authoritarian approach that are based on drill and external control, the constructivist approach highlights existing experience, prior knowledge, intrinsic motivation and mental patterns of individual students.

The general model of self-regulated learning (Pintrich, 2000) concentrates on the regulation of cognition, motivation behavior and context. Pintrich (1999) formulated a conceptual framework for studying self-regulated learning comprising four phases: planning and goal setting, controlling and reflecting. In this model, self-regulation is understood as the student's ability to be cognitively, motivationally and metacognitively active in the learning process towards achieving the set goals. Self-regulation is perceived as *“an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment”* (Pintrich, 2000, p. 453).

For example, the author's research (Pintrich, 2000) shows that there is a positive correlation between self-regulated learning and a student's level of self-efficacy. Students, who are convinced about their qualities and skills, more often use strategies to regulate their own learning than students who are deemed to be incompetent. Furthermore, the research shows that there is a reciprocal link between self-regulated learning and student's task value belief. Students who perceived a certain object as interesting, important and useful used more often self-regulatory strategies. They also found that students who focus on the learning processes, referred to as mastery goal oriented learners tend to be self-regulated students as opposed to those who only focus on the result of the activity, i.e. performance goal oriented learners.

One of the leading authors in this area, Monique Boekaerts (2002), deals with the diversity of self-regulation and self-control. The author draws on ideas from Kuhl and Fuhrmann (1998), who pointed out that students who use self-regulatory strategies (e.g. regulate attention, motivation, will and emotions), pursue their own goals by activating a self-rewarding system. In contrast, students who use self-control, follow a set of pre-established goals that are consistent with their personal beliefs, and therefore use a system of penalties. Other studies also show that the process of self-regulated learning is associated with positive emotions. Both processes are controlled by entity, but only the process of self-regulated learning is associated with intrinsic motivation.

According to Boekaerts (2005), initial motivation plays a central role in the process of self-regulated learning. The author believes that students invest time and effort to study hard because it's personally important to them. Their effort is in accordance with their subjective theories. However, it raises the question whether and how the teacher can affect the development of self-regulated learning and if it is inconsistent with student's academic self-concept. Self-regulated learning is not viewed as a unitary construct, but refers to a system concept that integrates activity in different control systems (Boekaerts & Niemivirta, 2005). A considerable amount of interrelated processes of self-regulated learning have been differentiated, involving motivation control, metacognitive control, action control, and emotion control. This analytical dissolution into different forms of control allowed to focus on particular aspects of self-regulation.

Zimmerman and Schunk (1989) described self-regulated learning as students' self-generated feelings, thoughts, and actions, which are systematically directed to achieve their goals. The theoretical basis of Zimmerman's cyclical model of self-regulation is to be found in the social cognitive theory based on the work of Albert Bandura. This model looks at self-regulation as the interaction of an individual's personality, his/her behavior (i.e., motivational, cognitive and affective components) and the external environment. Unlike behaviorism, which emphasized the influence of the environment on human behavior, the social cognitive theory sees the causes of human behavior in the so-called *reciprocal determinism*. This means that the behavior of the biological and internal layout of the individual and the external environment are interact. In other words, self-regulation is viewed as an interaction of personal, behavioral and environmental triadic processes (Zimmerman, 2005). An important issue is to find out how these processes are structurally interrelated and cyclically permanent.

From this point of view, self-regulated processes fall into three cyclical phases: forethought, performance or volitional control, and self-reflection (Zimmerman, 2005). According to the author, in the first phase, which takes place prior to the activity, students analyze their learning task. An important role in its implementation is represented by the students' motivational beliefs, perception of their own competence, goal orientation and interests. The second phase is the actual activity in which students regulate and manage their learning process, i.e. control and observe themselves in the activity. Further, they instruct and regulate their imagination and try to regulate their attention and study efforts. The third phase of self-reflection takes place after the learning activities are completed and concerns the response to the output. Students look at the learning experience, comparing its results with the stated objectives and also, for example, trying to explain its success or failure.

Wine's (2010) conclusions on the recent advances on gathering data and measuring constructs that comprise self-regulated learning are particularly relevant. According to the author, self-regulated learning is inherently *contextual* and can be conceptualized in terms of *events* (i.e. context evolves as learners regulate learning). The author believes

that self-regulation is present in every human activity although it might be still undeveloped. Successful students are different from the less successful ones in being able to start the process without external control and can easily improve their learning. Under the proposed model, self-regulated learning is inherently considered to be metacognitively regulated behavior allowing students faced with new tasks to dynamically control the selection and use cognitive tactics and strategies.

On the basis of these claims Wine and Hadwin (1998) have proposed the complex four-phase model of motivated self-regulated learning. In *phase 1*, learners make a judgment about the task from memories about similar tasks from the past, features typical of the current situation, knowledge about the task and personal attributes that applies to it. In *phase 2*, learners establish their goals and plans. In the *third phase* learners decide what tactics and strategies will be used. The *fourth* and final phase refers to a critical consideration of all the circumstances that occurred during all previous phases and can help students in the future when forming a generalization of their own metacognitive knowledge. Students pass through the different phases during the learning process, and each phase is defined by a different structure according to the conditions, operations, results (products), goals (standards) and evaluations. The authors also admit that the presented phase can be structured in a different order allowing learners to choose their own phase sequence.

Borkowski's process-oriented model (1996) is based on the metacognitive and information-processing perspective following the work of Flavell, Brown and Sternberg. Along with Winne's theory (1995), self-regulation is defined as a metacognitive process driven towards the development of cognitive strategies. Their theory is more strategically oriented and its development focuses on effective teaching. In contrast, other theories define self-regulated learning as a process that is more goal-oriented. Pintrich's (1999) and Zimmerman's (2002) model is based on the social cognitive theory. Both distinguish similar stages of the process and focus on the research of student motivation in relation to the frequency of use of self-regulatory strategies and school success. Boekaerts's model (2002) is also different from all the others, in that it emphasizes the initial phase of self-regulated learning, i.e. setting personal goals based on the assessment of the situation in a particular context.

Nevertheless, all models share common assumptions. Students who regulate their learning are understood to be active participants in their own learning process and adjust their actions, feelings and thoughts as needed in a certain situation. In other words, all the models assume that learners actively construct their own strategies and goals, from both the external as well as their own internal environment. Another hypothesis is that students have the inner potential to regulate their learning. All the models assume that learners can at certain moments control, monitor and regulate their cognition, metacognition, motivation and behavior and are able to organize their learning environment. Models of regulation presuppose the existence of criteria or standards (set goals) against which comparisons are made by the learners. On this basis, learners further decide whether to continue as before, or make the necessary changes.

3. A methodological critique of current approaches to self-regulated learning

There is a long history of evidence of the assessment procedures used by researchers worldwide to measure various aspects of self-regulated learning. The variety of research approaches used reflect how the changing definition of the self-regulated learning required the application of decontextualized, domain specific or the currently preferred context-sensitive measurements. A combination of procedures is also seen as important. In fact, linking the adequate assessment tools can provide a broader picture of the variations in the observed phenomenon, which one instrument fails to capture. On the other hand, more research is needed to determine the causes of measurement errors. However, the current state of art requires this approach with broader empirical research.

To reveal what self-regulated students feel, think or do while they are actively regulating their own learning is the main aim of many researches. The most widely used approach to achieve this goal is the self-report strategy. Reported frequency or level of students' self-regulated learning is most often measured using Likert scales in a

quantitative approach. The results depend on a relatively large sample of respondents providing founded conclusions.

What do items in self-reported learning inventories actually measure? Do respondents think what we mean? Typically, using items means asking a learner to imagine the self-regulated process and to answer on a scale anchored most likely by “not at all true of me” and “very true of me”. Situations are often expressed without specifying the context, for example, “*I ask the instructor to clarify concepts I don't understand well*”. In this case, the item doesn't focus on the particular course, situation, study environment or task but refers to self-regulation as a general skill. At other times, context can be specific and described as self-regulated learning activities within a specific course, “*I try to identify students in my courses whom I can ask for help if necessary*”.

Findings from the research carried out by Hadwin at al. (2001) raise questions about using self-reports that do not reflect context effects. Students were asked to self-report the study tactics they applied, the resources they used, and the goals they selected for studying in each of three apparently different contexts: reading to learn, studying for an examination, and preparing to write a think paper. The principal-components analyses reported that there was considerable shuffling of items across components due to variations of context. The authors' findings support the premise that students' reports of self-regulated learning are context specific.

Karabenick at al. (2007) states that even small changes in the construction of an item can change its meaning. The authors are primarily concerned with the cognitive aspects of the survey, i.e. to examine whether respondents' understanding of self-report items are in accordance with the meaning and deliberate intent of the researchers, and discuss the designed cognitive validity of self-report items. On the basis of the authors' information-processing model (2007), the respondent answering the questions also perceives new information, processing it concurrently in the context of stored memory with new information used to select a response. It is assumed that there are three critical points that may indicate whether the items were answered in a valid manner. The first critical point is the respondents' interpretation of the items (how students interpreted the item). The second is retrieving the information stored in the memory that is relevant to the item (what students felt and thought when thinking about the item). The third critical point is selecting the item option identical with the information acquired from memory (why students chose a particular answer).

How to construct scales that gain valid confidence in the meaning of the information they provide? These and other challenges have been identified by many researchers (Boekaerts & Corno, 2005; Nesbit & Winne, 2006). The authors argue that self-reports describe probable choices. Capturing traces that show the cognitive activity of learners while regulating their learning processes might be beyond the capabilities of general self-reports.

There is also confirmed evidence that learners incorrectly stated the frequency of occurrence when reporting various phenomena. If calibration were viewed as a kind of inter-rater agreement, students would be deemed quite unreliable in reporting the frequency in which they use specific tactics (Winne, Jamieson-Noel, & Muis, 2002). This issue, supported by other influences, is popular in the current research literature on how students respond to surveys and where they estimate the frequency of events. In this case, students need to collect memories and report about qualities such as frequency, usefulness, difficulty, or typicality, where their mental judgment and evaluation might unconsciously produce misleading results. Winne, Jamieson-Noel and Muis (2002) further note, that the wording of a question or its response scale implies counting (“*How many times do you...?*”) versus reporting rough categorizations (“*On average,...?*”). Researchers should bear in mind, however, that relatively negligible attention has been paid to the critique of current approaches of evaluating self-regulated learning. One of the several approaches used to assess the validity of self-regulation measured by self-report surveys is to analyze theories and items through the lens of a critical perspective.

4. From methodological criticism to ontological and epistemological reconceptualisation

Despite the fact that methodological criticism addresses the many defects of present research on self-regulated learning, we cannot just stay with it. Criticism of this type, though, forgets that problems with methodological strategies (namely, examine procedures of events as well as the empirical inadequacy of findings (their validity), might be caused by the inexact conceptualization of the social reality – its inadequate ontology and epistemology. Due to this fact, we claim that other critically - oriented research of self-regulated learning cannot only be based on much higher reflexivity or research methods, but also with a much stronger emphasis on its metaphysics, since it creates the prior (not realized) essence of its examination. De facto is, as Imre Lakatos (1970, 1978) once described, the essence of each scientific research programme, i.e. concealed premises that lead the research and are not to be impeached in any way.

The main argument in this direction is based on the fact that the above specified discussion on “recentering“ the study of self-regulated learning is performed dominantly on the level of the “middle continuum of science“ (Alexander, 1987). It means that it is performed mostly on the basis of theoretical models and methodological devices and not on the basis of ontological bases and epistemological strategies, because those are always foregoing them. As we are admonished by John Searle: “ (...) social ontology is prior to methodology and theory. It is prior in the sense that, unless you have a clear conception of the nature of the phenomena you are investigating, you are unlikely to develop the right methodology and the right theoretical apparatus for conducting the investigation” (Searle, 2009, p. 9). For the optimal formulation of new theories and/or methods we need to focus our attention also on the abstract initial continuum of science where ontological as well as epistemic assumptions in the examination of reality are situated.

From this point of view there is nothing else occurring other than our interest to focus on self-regulated learning from the perspective of the philosophy of science that allows to formulate questions such as: *What type of self-regulated learning is it? What are its characteristic features? What is included in the study of this event and what is on the other side omitted and why?* Through this procedure we want to offer a framework not only for the construction of more exact theories and approaches for studying self-regulated learning, but also a more effective and more sensible methodology, because we strongly agree with Gaston Bachelard (1968) that “ the instrument always creates discovery“. Nevertheless, the construction of any research instrument is not possible without the pre-understanding of what shall be examined by it.²

5. Critical realism as the framework for examination of self-regulated learning

As the appropriate approach to the specified objective seems to be philosophy of *critical realism*, that arises from the work of British researchers Rom Harré (Harré & Madden, 1975) and Roy Bhaskar (1989, 1998, 2008, 2009), who under different labels - transcendental realism, critical naturalism, new realism, dialectical realism etc., developed the approach that has now become domesticated in psychology (Harré, 1999; Harré & Gillet, 1994), sociology (Archer, 1995; Archer, Bhaskar & Collier, 1998), economy (Lawson, 1997), theory of international relationships (Patomäki, 2002) or more generally in philosophy and methodology of social sciences (Elder-Vass, 2010, 2012; Sayer, 2000, 2010). Since critical realism is a very diversified approach today, we have to state that our study will be derived from the work of Roy Bhaskar and his followers, whereas the works from the flow of critical realism that is inspired by the thoughts of Rom Harré shall be used only sparsely .

² In order to explain this point, we have to say, that we have to consider each phenomenon as a black box to be revealed. The method to reveal each black box (i.e. what components are placed to it, what relationships are outlined between them and what principles of activity between them are supposed), is the result of philosophical work and not empiric research. Only by their determination we can empirically examine if our assumptions are adequate to reality or not.

The philosophy of critical realism is constructed around three main concepts that shall be here used for *the reconceptualization of self-regulated learning* – i.e. this phenomenon will be analysed through the three ontological assumptions. We shall consider the following:

- (1) *The multidimensional and multilevel conception of reality* that defines reality as a sovereignty stratified in different areas with their own principles, but always mutually connected. The use of this approach allows us to see self-regulated learning as a phenomenon subdivided into different domains and levels of reality, and not as a unitary phenomenon with unified characteristics. We are convinced that due to this fact we shall be able to record in a better way its heterogeneity and “plasticity“, as mentioned by Daniel Little (2006, 2009).
- (2) *The concept of causal mechanisms* that allows us to formulate optimal theoretical conceptions of the middle range and together with that outline the general programme of research on self-regulated learning based on the determination of crucial mechanisms that are activated in the case of self-regulation. Whereas causal mechanisms will be understood: “(...) as the ultimate unobservable physical, social, or psychological processes through which agents with causal capacities operate, but only in specific context or conditions, to transfer energy, information, or matter to other entities” (George, Benett, 2005).³
- (3) *Specific understanding of causal tendencies* on which we can create a base for a different viewpoint on the impact of individual components on causal mechanisms within self-regulated learning than the one that is offered by positivists - oriented approaches, whether they take on the form of behaviourism, and thus are present in classic models of self-regulation (Boekaerts, 2002, Pintrich, 1999), or their framework of ideas arises from procedures of the first generation of the “grounded theory“ (Glaser & Strauss, 1967), where we can also identify many positivistic tendencies (see Charmaz, 1996, Clarke, 2003).

6. Domains and levels of social reality

Critical realists state that reality is *stratified*. It consists of two main lamellately organized components: (1) the *so-called domains of reality* where events and occasions are expressed in totally different ways, and (2) *the levels of reality*, having their own special class of events, resp. mechanisms, that produce such events. In different ontological domains, events or occasions have a different status.

It is typical for ontological domains that they differ from each other in terms of the different character of being of things and occasions. With regard to this issue, Roy Bhaskar (2008, p. 13) recognizes three domains: (a) *real*, (b) *actual* and (c) *empirical*. Considering the domain of the real, we can state that it is the deepest dimension of the social world where things exist independently from their being experienced or examined, while ain of the actual consists of all things and events that are known but are not experienced directly by specific participants. In other words, the domain of the real represents the world of possibilities, while the domain of the actual is the world that people know. The domain of the real is therefore crucial for critically-realistic ontology because the “origins“ of all things – causal mechanisms, are to be found in this domain, and they cause the establishment/emergence, transformation or lasting of certain events. Finally, as the third ontological domain we shall consider empiricism which includes only that what happens to participants, what belongs to the sphere of their actual experience, what they experience subjectively.

The *concept of domains*, that on the one side exceeds the positivistic and on the other side the radically constructivist vision of the world, has crucial consequences for understanding self-regulated learning. Firstly, it shows that self-regulation cannot be understood only as an event that takes place in the *domain of the actual*, i.e.,

³ For summary of other influential conceptions of mechanisms see (Hedström, Swedber, 1998; Hedström, 2005, 2009; Little 2006, 2009, 2010).

what can be said by participants by virtue of their previous understanding and knowledge, and it is an assumption criticized today by many authors (Winne, Jamieson-Noel, & Muis, 2002; Nesbit & Winne, 2006, 2010). Nevertheless, it cannot be even considered a phenomenon that is bound to the *domain of the empirical*, i.e., to collections of presently reflected contents of participants' cognition and detectable practice. Preference for the domain of the empirical leads to the fact that the domain of the real is neglected, where according to Bhaskar causal mechanisms are included that do not have to be realized by the participants or researchers, but despite that they create the whole situation giving rise to specific results of the learning processes that they support or protect. Each analysis of self-regulated learning should therefore reflect all three domains of reality and especially consider how the domain of the real is manifested in the other two domains.

The *concept of levels* states that reality is lamellately organized. We can find higher as well as lower levels in it that are mutually conditional. Whereas a different *causal mechanism*, i.e., the mechanism of change of structures or emergence of new entities is typical for each of them that are typical for the respective level (Bhaskar, 2008, pp. 168–169). Therefore, different levels of reality reveal different mechanisms pointing to the transformation of their structures. Due to this fact, the reasons for changes in structures can firstly be found always at the level the structures belong to. Human actions, therefore, cannot be explained by psychological (for instance, features of personality) nor biological (for instance, genes) phenomena, but first of all by social mechanisms. Thus, each stratum is autonomous of a certain dimension (Collier, 1994, pp. 111–116).⁴

Nevertheless, this autonomy is never total. Therefore, we should add that also mechanisms at lower or higher levels can partially interfere with causal mechanisms, which in turn might change the results of their activity. Considering the coexistence of both features, we find that in social reality there are two ways of mechanism activity. The first operates *horizontally* and leads to the transformation of structures on that level, and the second is shown *vertically* and can partially modify impacts of horizontal mechanisms; though it does not represent the reason for events/occasions.

Thus, social reality itself has a relational character (Bhaskar, 1998, pp. 32–35; 2009, pp. 85–90; Sayer, 2010, p. 4), because individuals are never alone but always act in mutual relationships of dependence where different causal powers might be identified among them. In these terms, social structures represent assumptions and results of human activity, they are its necessary condition as well as the product of the participants' activities. In this context, we shall also mention (see also Bhaskar, 1989, p. 4) that all social structures depend on previous social relationships and on their mutual. Therefore, it is erroneous to claim that social structures are able to be transformed easily and at will. Their change always depends on previous configurations.

For the study of self-regulated learning, a few substantial consequences arise from the critically-realistic ontology. One of the most important is that we have to consistently identify all levels in which self-regulation takes place, because only in that way we can determine the particularity of some mechanisms (their belonging to the specific layer of reality); resp., we have to determine which level of self-regulated learning is primary for a certain phenomenon. If it is a phenomenon which is primarily bound to the human psyche, as argued by behaviouristically - orientated authors (Boekaerts, 2002; Pintrich, 1999, 2000), or which is the result of social behaviour (Zimmerman & Schunk, 1989; Zimmerman, 2005). *What more?* Questioning from this perspective leads to other crucial questions: *Does self-regulated learning really specify one unique complex mechanism or are there a few different mechanisms that are situated on different levels of reality?* If the second possibility is true, individual mechanisms should have different features and a different logic of operation.

Therefore, we think that any further examination of self-regulation needs to emphasise the necessity of

⁴ We add that strata can be distinguished in two senses. Firstly, we should consider levels of totally different orders: for example anorganic, biological, psychic and social. The second case focuses on different levels within the certain more general stratum, for example within social world we can consider economical, political or cultural sphere as well as micro, macro or meso level.

determination of mechanisms that are being performed on different levels of reality. In these terms, we should consider: (a) the *level of culture* that has partial autonomy (Alexander, 2003; Kane, 2000), and where we can find meaning in the form of symbols, labels and codes, that allow people to understand the world and that are the basic contents of learning; (b) the *level of social actions and relationships*, for which connections among the social participants are typical as well as performative acting, the power of individuals and other status features that belong to them and affect the learning situation; (c) the *level of the psyche*, where interpretations/feelings of the abovementioned events take place and on the basis of which the participant considers his doctrine, rules it and reflects; (d) the *level of neuropsychological processes* that depends on biological processes in human organisms (for instance hormonal regulation) and that affects the receipt of impulses from the outside environment.

If we consider for instance Zimmerman's (2005) theory in this perspective, we discover that the author's conception is in fact situated at different levels of reality. While the role of personality in it supposes mechanisms on the psychic level, the area of behaviour primarily includes (but not only) mechanisms related to social acting. The author's last area of interest, that according to him reciprocally determines the previous ones, is generally the specified environment where mechanisms at the cultural level, social relationships and material artefacts can be included. From the perspective of critical realism we can therefore critically state that Zimmerman took a long step ahead when he started to consider self-regulation as the phenomenon co-created by different levels. Nevertheless, he has not been sufficiently consistent in conceptualizing them nor in his thinking since he mixes many of them and does not differentiate among them analytically enough.

The focus on different levels of social reality has also one more important aspect, apart from allowing to separate analytically mechanisms at the horizontal and vertical levels: to separate from each other the powers that transfer structures at the same level of reality (for instance psychic processes which change the participant's personality or specific human actions leading to higher effectivity of learning) from powers that only speed up or protect and/or partially modify the emergence of those phenomena/entities.

Finally we should mention that if we accept the statement on relationships of social reality, we have to consider those participants whose self-regulation is being examined always as individuals placed in specific, historically, culturally and socially situated relationships, having the unique configuration that creates a figure of mutual activity of the specific levels of social reality together with its mechanisms. Due to this fact Rom Harré (1999, Harré & Moghaddam, 2003) unambiguously states the necessity of "positional analysis", since the social position of the individual affects in a crucial way his psychic processes, and interferes in a gross way with his cognitive and emotional processes.⁵ Each situation of the individual's participation in self-regulation is therefore always unique, bound to the context which current authors including Winnie (2010) have clearly noticed..

7. Causal mechanisms and causal tendencies

Another base of critical realism can be considered the *concept of causality*. The classic model of causality works along the simple scheme of cause and effect, determined upon the (time) regularity of the occurrence of changes between dependent and independent variables. In the language of formal logic it is usually known as: „if A., then B“ (see especially Hempel, 1965). Nevertheless, such a model of causal relationships fails in a few points (compare especially Lawson, 1997, pp. 17-30). Firstly, it does not correspond to the world's character that it tries to explain. Causes of events and objects always lie in the domain of the real and not in the domain of the empirical and actual that are usually examined by researchers. The regularity between two variables, therefore, does not have imply the existence of a causal relationship. There might be other interfering variables that cause the change without it being

⁵ As inspiring alternative of positional analysis we can consider for studying of self-regulated learning principles of methodological localism of Daniel Littel (2006, 2009, 2010). A much stronger focus on context in social research is acknowledged also by Isaac Reed (2010, 2011).

noticed. Secondly, the regularity itself of one variable impact on another is problematic since it always depends on the specific situational conditions and other elements including accidental factors, which have an impact on the result of their activity (see also scheme No. 1). Due to this fact, critical realism does not rely on the causal scheme „cause-effect“, but on the so-called *causal mechanisms* that are situated in the domain of reality.

The activity of these mechanisms, as emphasised by Bhaskar (2008, p. 50), is not typical of any regularity or power, but only a specific tendency in the direction that is affected by the activity of other mechanisms. We cannot therefore talk about causal connections, but only about specific tendencies or typical figures. This is because if any other mechanisms interfere with this tendency, totally different effects might occur. The results of a specific combination of variables, therefore, do not imply the permanent property of variables or conditions that generate them. They are only the tendency which is typical for a certain set of them, but it can be changed any time and the results themselves are rarely identical.

According to Bhaskar (2009, pp. 73-74), the method describing how production mechanisms work can be illustrated in the chart below that shows how mechanisms influence each other during their activity and how they affect due to the combining results of their mutual activity. The chart also shows the main difference between the classical conception of a multifactor causal effect, which is used, for example, by factor analysis, and figures of causal mechanisms.

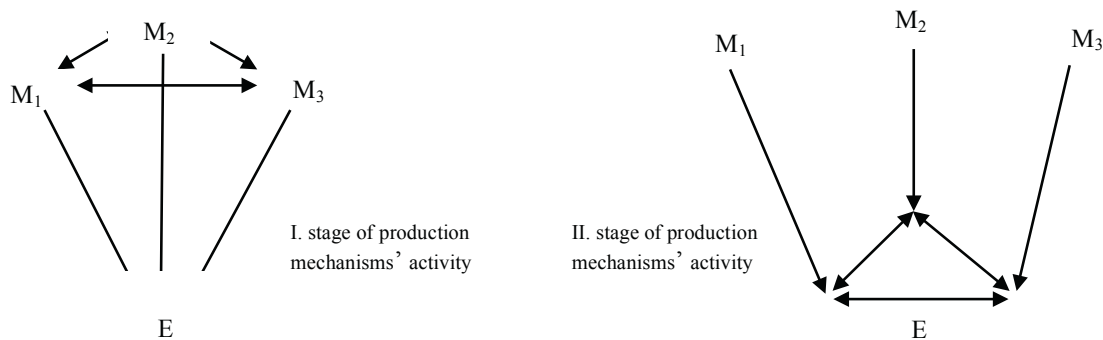


Fig. 1. Activity of causal mechanisms.

During the first stage of activity of the individual components of the specified mechanisms individual and/or of a few mechanisms together (M_1 to M_3), we can observe how they influence each other, underlying what will be their final impact – effect (E). There is a different activity of production mechanisms typical for the second stage which causes different effects. These depend especially on the interaction of causal activity results causing the instability of the result (E). Due to this fact, we should look at the activity of the product mechanisms as a *tendency* and not as *simple causal relationships*. Within them we can determine only the tendency of activity, not its exact result.

8. Discussion

Successful students are often described as active learners who are responsible for their own learning (Zimmerman, 2002). Those students direct their own learning without being directed from the outside. Additionally, self-regulated students complete their learning tasks better, they are more motivated and successful in school. Despite numbers of theories and models on self-regulated learning having been examined for decades, there is no specific model that can be applied when researching the process of regulated learning. In this context, research approaches were exposed to criticism for not sufficiently reflecting the real examined phenomena of self-regulated learning occurring in a particular context, and in certain situations to specific participants. Accordingly, self-regulated learning should be treated as a situation specific construct (Greeno, 2006).

Recent empirical studies on self-regulated learning should therefore reflect all three domains of reality (i.e. the real, actual and empirical domains). An alternative sense of scientific research in studying self-regulated learning arises from the concept of causal mechanisms which we believe also reflects many points of the current methodological critique (see Hadwin et al., 2001; Karabenick et al., 2007; Winne, Jamieson-Noel, & Muis, 2002). A strong scientific programme (Bloor, 1991) should be based on the search for *specific causal mechanisms instead of great theories describing results of self-regulated learning with no regard to the variability of its context, contents and participants*. Therefore, we have to find a methodology which will help to discover the specific causal mechanisms operating in the respective environment. In other words, rather than a universal invariant structure, *we should try to find an explanation of variability in the mechanisms of self-regulated learning, i.e. signs of what cause the main differences – especially changes and variations – through time and space in the character of self-regulated learning*. Such alignment seems to be especially important when we realize that social/psychic entities are not fixed objects with stable features, as argued by Abbot (1999), but always changing “plastic entities” (Little, 2006, 2009). Transferring the focus on variability and mechanisms, though, allows us to avoid dangerous essentialism and reification of the respective phenomenon.

With regard to such formulated epistemology, we have to add that we should consider mechanisms of the above mentioned levels, i.e.: (a) how different cultural contents (symbols, meanings and codes) affect self-regulated learning that seems to happen after a „cultural turn“ (Back et al., 2012; Crane, 1994) in the social sciences more important objective; (b) how different forms of actions, practices and social relationships affect self-regulated learning – how the ability to manage one’s own studying activity emerges within the network of social relationships; (c) how different interpretation operations and psychic mechanisms affect self-regulated learning at the level of human cognition. Combining together the three levels and their crucial mechanisms will allow disclosing what causal tendencies are created by these mechanisms and, therefore, allow the whole variability of results of self-regulated learning to be established.

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