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Russian and American Perspectives on Self-regulated Learning

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An overview of the literature on leading models of self-regulated learning in the United States and Russia is presented in an effort to identify, compare, and contrast the most current views in the two countries on the nature and structure of the phenomenon. We have chosen six models that have been extensively cited in current American and Russian research literature and have empirical studies that support them. They differ to some extent in theoretical stance, definitions of the construct, and the components included in the models, but at the same time, they share important underlying characteristics.

INTRODUCTION

Personal control, or self-regulation, of learning, is an umbrella term that describes students' ability to evaluate the demands of a learning task at hand, to identify and implement the appropriate learning strategies, and to readily accept responsibility for one's own learning (Pintrich & DeGroot, 1990; Pressley & Ghatala, 1990; Schunk, 1995; Thomas & Rohwer, 1993; Weinstein, Zimmerman, & Palmer, 1988; Zimmerman, 1990, 2002). Self-regulated learners are depicted as metacognitively sophisticated, highly motivated agents of their own behavior, who believe that learning is a proactive process, and use strategies that enable them to achieve desired results (Corno, 2001; Weinstein, Husman, & Dierking, 2000; Zimmerman, 1998, 2000).

The construct of self-regulated learning has been widely studied. With more and more emerging research, definitions of self-regulated learning have become increasingly complex. Early studies defined self-regulated learning in terms of metacognitive awareness, planning and strategy use (Flavell, 1976). This definition evolved to include students' knowledge, motivation, metacognitive skills, and cognitive strategy use, as well as interaction among these components. Self-regulation has been conceptualized by a number of researchers as a product of the skill and the knowledge that students accumulate over time (Butler & Winne, 1995; Paris & Byrnes, 1989; Schunk, 1989). Others consider self-regulated learning as emerging from more than individual knowledge and skill. Zimmerman (1995), Paris & Paris (2001) and Butler (2002) argue that self-regulated learning occurs in a social context where students are

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motivated to purposefully and strategically engage in the learning process within environments that promote self-regulation.

The theory of self-regulated learning offers a synthesized perspective for understanding how different components and elements of learning are related to each other (Boekaerts & Niemivirta, 2000). However, researchers in the field do not share a single theoretical model of self-regulated learning, nor do they agree on a single set of factors that might influence it. Rather, a number of models of self-regulated learning with different emphases have been introduced and different individual and contextual characteristics have been proposed in relation to students' self-regulatory skills (Butler & Winne, 1995, Pintrich & De Groot, 1990; Schunk, 1994; Winne, 1995; Zimmerman, 2000).

Interest in self-regulated learning is not limited to American educational psychologists. Self-regulated learning has also been a topic of research and scholarship in Russia, with Russian scholars looking at self-regulated learning from a variety of theoretical lenses. There is little evidence that the Russian work in this area has influenced American researchers, because rarely is the Russian literature cited in American research. Similarly, there is very little evidence suggesting the impact of American theorists on Russian conceptions of self-regulated learning. Given this state of affairs, it would seem worthwhile to compare the leading Russian theorists to the leading American theorists. This paper focuses on major models of self-regulated learning from both the U.S. and Russia, and tries to highlight similarities and differences among schools of thought. Three models by American researchers and three by Russian researchers were chosen on the basis of which scholars' work was most frequently cited in the professional literature. The review begins with the American research.

THE AMERICAN MODELS OF SELF-REGULATED LEARNING

Winne's Model of Self-Regulated Learning

Winne (Butler & Winne, 1995; Winne, 1996b; Winne & Hadwin, 1998; Winne & Perry, 2000) conceptualizes self-regulated learning as consisting of four recurring stages. The first stage of the model is task definition and involves students' perceptions about the task. The second stage includes planning and goal setting. The third stage involves enactment of actions and strategies planned in stage two. Finally, stage four is characterized by students' analysis of the preceding stages through the prism of their metalevel knowledge. The learning processes are believed to generally proceed from stage one through stage four, however, as Winne and Hadwin (1998) admit, the system is not strictly sequenced and different progressions may exist.

In addition, Winne and Hadwin (1998) described a set of interacting processes that occur within each stage, namely conditions, operations, products, evaluations and standards *Conditions* are divided into cognitive, which represent the resources endogenous to a person, and task, which include the resources exogenous to a person along with various constraints of the environment. Conditions determine the way the task will be engaged and executed. Goal orientation, personal interest, learning styles, and dispositions are examples of cognitive conditions, and time available for task completion, instructional cues, and outside help are instances of task conditions. *Operations* refer to the cognitive processes and strategies that students employ when attempting a task, e.g. searching, monitoring, assembling, rehearsing, and translating. *Products* are defined as information created by operations in changing conditions. Products are divided into internal (e.g. inferences) or external (observable per-

formance), and a different product is created at each stage. *Evaluations* represent internal and external feedback about the products, and *standards* consist of the criteria against which the products are gauged. Through monitoring and control, feedback about the discrepancy between products and standards adjusts conditions of previous stages (Butler & Winne, 1995; Greene & Azevedo, 2007; Winne & Perry, 2000).

Winne (1997) proposed that self-regulated learning is twofold, and can be viewed as an aptitude and as an event. An aptitude is a relatively constant trait of an individual which can be applied in different contexts and on different tasks, and can be used to predict future behavior. For example, if students indicate that they use elaboration when studying history, then it is inferred that they can exhibit this behavior regardless of domain (e.g. science, math, social studies). On the other hand, when self-regulated learning is regarded as an event, contextual variables assume a much more important role. For instance, students may use elaboration to learn about World War II in history class but, due to specifics and demands associated with their foreign language class, choose not to use the same strategy when working on their Spanish homework. Because viewing self-regulated learning as an aptitude or an event involves different assumptions about the properties of the phenomenon, Winne applied two distinct methodologies to derive and validate his model.

First, self-report questionnaires were used that helped identify steps involved in the learning process, study tactics, and cognitive strategies used by students, as well as task characteristics which are taken into account when students devise a plan to successfully complete a task. According to this perspective, self-regulated learning is a relatively stable aptitude, and it is assumed that a single measure is appropriate to evaluate self- regulated learning based on multiple events.

Second, Winne (Winne & Jamieson-Noel, 2003; Winne & Perry, 2000) employed a trace methodology to investigate observable indicators of cognition, such as annotation, highlighting, mnemonics, and outlines, created by students when studying. Whereas protocols that measure self-regulated learning as an aptitude attempt to capture stable behavior, trace methodology is based on the assumption that self-regulated learning is an event and therefore is used to capture the dynamic nature of the phenomenon. For example, trace methodology assumes that when learners mark the text (such as underlining), they are discriminating that particular content from the surrounding content. Written traces are believed to represent an objective measure of students' use of strategies.

A study conducted by Winne and Jamielson-Noel (2002) exemplifies a combination of both methodologies. In an attempt to examine the perceived and the actual use of study tactics and the perceived and actual achievement, the researchers administered a multi-section study questionnaire to 69 undergraduate students, and used PrepMate software to record the tools they employed to complete the proposed task. Students were asked to read a chapter, describe important concepts, explain cause and effect relations, apply principles to explain phenomena, and generate and evaluate alternative solutions. In PrepMate (Chu, Jamieson, Winne, & Field, 1998), students could create notes using numerous tools: pasting information copied verbatim from other windows, highlighting text in notes, generating questions, developing mnemonics, creating analogies, or recording any other form of information that they wished to have in a note. The use of the available tools was logged by the software and further compared with the results obtained through questionnaire. The comparison indicated that students tended to be moderately positively biased about their use

of study tactics. Specifically, students reported that their studying was more active and varied than it actually was, as demonstrated by the logged traces. Winne and Jamielson-Noel (2002) conclude that although "self-reports unequivocally represent students' interpretations about how they study, such self-reports may not accurately indicate what students actually do when they study," (p. 568). The combination of the two methodological approaches in the aforementioned study and other studies conducted by Winne and colleagues allowed the researchers to build a solid and credible conceptual model of self-regulated learning substantiated by empirical inquiry

In sum, Winne (1996a) defines self-regulated learning as a metacognitively guided behavior which allows students to adjust and control the use of cognitive strategies and tactics when attempting a new task. In contrast, Pintrich and Zimmerman view self-regulated learning as more of a goal-oriented process. They stress its constructive nature and agree that monitoring, regulating, and controlling of the learning include not only cognitive but also motivational, emotional and social factors.

Pintrich's Model of Self-Regulated Learning

Pintrich (2000; Pintrich & De Groot, 1990; Pintrich, Wolters, & Baxter, 2000) developed a complex framework, according to which self-regulated learning is comprised of four phases: forethought, monitoring, control, and reflection. Each of these phases in turn includes four self-regulatory activities pertaining to cognition, motivation/ affect, behavior, and context. The first three activities represent the traditional tripartite division of dimensions of psychological functioning, and reflect aspects of students' own cognition, motivation, and behavior that they control or self-regulate. The fourth activity included into the framework takes into account the possible attempts of other individuals in the environments, such as teachers, peers, and parents, to regulate students' cognition, motivation, and behavior by directing students, providing them with tools and techniques, and showing how and when to do a certain task. In other words, context, which encompasses social interactions along with task characteristics, can facilitate or hinder students' ability to self-regulate. Therefore, students' ability to self-regulate includes their capacity to control and regulate the context adaptively (Pintrich, 2000).

The self-regulatory activities that occur during the *forethought* phase include metacognition and prior content knowledge activation (cognition), efficacy judgments and goal orientation (motivation and affect), time and effort planning (behavior) and perceptions of task (context). The *monitoring* phase involves awareness of cognition, motivation, time, effort, task, and context conditions. The *control* phase consists of the selection of strategies for directing thinking, motivation and affect, and strategies for the regulation of effort and task. *Monitoring* and *control* together oversee the performance of the task. The final phase of *reflection* includes cognitive judgments, affective reactions, making appropriate choices and evaluations of task and context (Pintrich & Zusho, 2002b).

The four phases represent an ordered sequence that students go through as they perform a task, but there is no assumption that there is a hierarchical or linear relationship among the four phases such that an earlier phase must always occur before later phases. Monitoring, control, and reflection occur dynamically as the student progresses through the task, with plans and goals of the forethought phase being modified and altered based on a feedback from the monitoring, control, and reflection pro-

cesses. Moreover, Pintrich (2000) proposed that not all academic learning follows the four identified phases, as there are many academic situations in which students learn the material in more unintentional ways without the need to self-regulate. It is important to note that Pintrich developed more of a theoretical framework for self-regulated learning rather than a thoroughly tested empirical model. For instance, Pintrich's monitoring and control phases are quite difficult to differentiate (Pintrich et al., 2000). Although there is a conceptual difference between the two stages, it is hard to empirically separate them, as monitoring, or self-observation, and control of cognitive processes seem to occur simultaneously. Pintrich's framework helps researchers organize the plethora of lines of self-regulated learning research that have been conducted or are being conducted in the field (Greene & Azevedo. 2007).

Pintrich (Pintrich & Zusho, 2002b; Pintrich, 2000) defined self-regulated learning as an active process in which students set goals for their learning and strive to monitor and regulate their cognition, motivation, behavior and context to achieve those goals. Pintrich (Pintrich & Zusho, 2002a; Pintrich, 2000) emphasized the constructive, or self-generated, nature of self-regulated learning and stressed the influence of both per- sonal and contextual characteristics on the execution of self-regulatory strategies. In other words, self-regulated learning is viewed as a mediator among learner characteri- stics, context, and performance (Greene & Azevedo, 2007). These ideas are very close to Zimmerman's (2000) view on self-regulated learning in that they both assume that monitoring, regulating, and controlling learning include cognitive but also motiva- tional, emotional and social factors.

Zimmerman's Model of Self-Regulated Learning

Zimmerman developed a model of self-regulated learning based on Bandura's (1986) social cognitive theory (Zimmerman, 1990a, 2000, 2002). He theorized that self- regulation is determined by three separable, yet interconnected, factors: personal, behavioral, and environmental events that influence individuals' functioning. Personal, or covert, self-regulation consists of monitoring and modifying cognitive and affective states. Behavioral self-regulation involves self-observation and adjustment of one's performance processes, and environmental self-regulation comprises observation and adjustment of varying environmental conditions (Puustinen & Pulkkinen, 2001; Zimmerman, 1990b).

Zimmerman (1990b) defined self-regulation as thoughts, feelings, and actions that are planned and continually adjusted to better attain one's personal goals. Zimmerman's (1990b) conception is in line with Winne's view: self-regulation is cyclical in nature, and includes a forethought phase, a performance phase and a self-reflection phase. The forethought phase involves processes relating to task analysis and those relating to self-motivation beliefs that precede actions. The performance phase contains two processes: self-control, which helps students concentrate on a task and optimize their efforts through attention focusing, task strategy selection and implementation, imagery and mental picture forming; and self-observation, which refers to students' mental tracing and recording of specific aspects of their own performance. The self- reflection phase involves two types of processes: self-judgment (or self-evaluation), and self-reaction. Self-evaluations of one's own performance, as well as causal attributions concerning the obtained results, are involved in self-judgment. Affect regarding performance and inferences about what will have to be changed in future situations is involved in self-reaction. Because of the cyclical nature of self-

regulation, self- reflection influences forethought processes. In other words, feedback that individuals get from prior learning experience is employed to modify strategy choice and goals for further efforts. These modifications are believed to be crucial as personal, behavioral, and environmental factors continuously change during learning. Numerous empirical studies have been conducted to test Zimmerman's model, establishing its plausibility and stability across contexts and populations (see, for example, Schunk & Zimmerman, 1997; Zimmerman, 2000b; Zimmerman & Bandura, 1994; Zimmerman & Martinez- Pons, 1988).

The next sections present the models developed by three leading Russian scholars. These models are the most widely cited work in the Russian research literature on self-regulated learning. The first author of this manuscript is a native Russian speaker and reviewed this work in Russian.

THE RUSSIAN MODELS OF SELF-REGULATED LEARNING

Konopkin's Model of Self-Regulated Learning

Konopkin (1995) investigated the nature and theoretical underpinnings of human self-regulation in many different aspects of individuals' life, including the academic domain. He defines self-regulation of activity as a systematic process which involves planning, initiation, execution, and control of actions geared towards realization and attainment of specific goals. In this model, self-regulated learning is believed to be a circular recursive system, which consists of well-defined functional links that carry out specific regulatory functions. Konopkin (1995) derived links, or components, of his model, guided by the necessity/sufficiency principle, through his extensive conceptual work. This research resulted in a model in which, according to the author, each component represents a conceptually distinct, non-overlapping entity which together fully define the process of self-regulation. All links in the model are assumed to interact and jointly carry out the process of self-regulated activity in an effort to reach a desired goal.

The following six components are believed to comprise the structure of the process of self-regulated learning. The *goal* serves the purpose of initiation and subsequent orientation of every action taken by a student. All other links of the system are based on and determined by the initially formulated goal. *Conditions* represent information about characteristics of a task, context and available cognitive resources which students identify as important for successful task completion. The identified conditions are used to revise the goal and to carry out appropriate actions. *Actions* represent the actual steps that individuals take to reach a goal taking into account specifics of the situation in which they operate. The *criteria for success* component contains information about the final outcome of individuals' actions. The *control and evaluation* component informs individuals about correspondence of the current state to the final state as defined by the criteria of success component. Finally, the *correction* component continually clarifies the initial goal and adjusts actions which individuals take to complete a task and accomplish desired result based on the information provided by the control component. All links in the system are interconnected and are altered in a chain reaction as new information both from the environment and from within the person comes into the system (Konopkin, 1995; Konopkin & Morosanova, 1989).

The model seems to successfully describe the structure of self-regulated learning, however, despite the author's rather extravagant claims about conceptual clarity, suffi- ciency, and the exhaustive number of its components, it doesn't explicitly

include stu- dents' motivation[1] or affect. Rather, Konopkin (1995) only addressed motivation as one of the many personal characteristics affecting self-regulated learning. Other cha- racteristics include temperament, emotionality, self-efficacy, and intelligence. It's important to note that Konopkin's theory is one of the most highly regarded in the Russian literature. As Albukhanova-Slavskaya (1999) remarks: "Konopkin's contribu- tion to the exploration of the phenomenon of self-regulated learning is remarkable. His model is universal and should be used as a starting point for further investiga- tions." A survey of the current literature shows that Konopkin's model is indeed recognized. Every author herein mentioned bows to Konopkin at some point when discussing self-regulated learning. Interestingly, Konopkin has written a large number of conceptual articles and books, but, no empirical studies were found that tested the proposed model of self-regulated learning.

Ivannikov (1991), too, tackled the topic of the structure of self-regulated learning. His view on self-regulated learning is similar to Konopkin's (1995) but Ivannikov looks at the construct from a slightly different angle, and shows the evidence accrued in the course of empirical work.

Ivannikov's Model of Volitional Control of Learning

In his research, Ivannikov (1991) used the term "volitional control of learning" when referring to the construct conceptually similar to self-regulated learning. He defined volitional control of learning as a conscious mental effort channeled towards achieving desired predetermined goals. Ivannikov (1991) proposed a structure of self-regulation composed of three main building blocks. The first block is *motivational* and includes intentions, goals, and motives that direct and sustain individuals' effort. The second block is *executive* and involves the actual actions individuals take and strategies they employ to reach the objective. Finally, the third block is termed *evaluative* as it includes the results of activity and their correspondence to the predetermined criteria.

Ivannikov (1991) asserted that all three blocks must be present for a successful volitional regulation of learning to occur. However, students tend to differ in how much each of the blocks is developed. Ivannikov (1991) conducted a series of interviews and observational studies in an attempt to derive a list of objective indicators of volitional control of learning. His study was conducted on a sample comprised of 345 under- graduate and 250 high school students. Ivannikov (1991) employed a grounded theory approach (Glaser & Strauss, 1967) in which he studied qualitative data to understand how self-regulated learning manifested itself in classrooms. Through the analysis of transcripts of interviews and observational logs, the researcher developed a broad definition of self-regulated learning: "the conscious mental effort channeled towards achieving desired predetermined goals." This definition served to set the boundaries for the phenomenon under investigation.

He then compiled a list of possible indicators of self-regulated learning. The resulting indicators were coded and factor analyzed to determine the underlying common constructs. The results of such undertakings confirmed Ivannikov's (1991) three-block model. Indicators of the motivational block include time on task, number of attempts to solve a problem, and hierarchy of goals. Among the indicators of the executive block are seeking outside help, use of materials and mnemonic devices, and

[1] Konopkin makes a conceptual distinction between goals and motivation. For the purposes of consistency we kept the two notions separate in this paper.

employment of different tactics to solve one problem. Finally, adjustment and change of approaches to the task, restatement of the initial goal, and additional actions taken to approximate the initial objective even if the obtained result is different from it, are among the indicators of the evaluative block. Ivannikov's checklist is used by students and educators as a diagnostic tool to uncover possible difficulties in the process of self-regulated learning.

In his more recent research, Ivannikov (1998) focused on the motivational component of volitional control and proposed three dimensions which helped students direct and sustain their investments in learning. These include significant relationships, personal importance, and background. *Significant relationships* help students create context, set goals, and support their strivings towards those goals. *Personal importance* refers to connections student makes between what goes on in school and their personal lives and how relevant they think school tasks are to their personal objectives. *Background* is defined as existing skills, knowledge, attitudes, personal philosophy, and behaviors that students bring into educational context from their home environments or prior schooling experiences. The three dimensions are believed to overlap with each other and vary in size and in dominance from one student to another.

Goals were identified as one of the components of the motivational block of volitional control. Ivannikov (1998) emphasized the crucial role of goals in human activity. He suggested that any activity without a defined goal is pointless, and any goal without actions taken to reach it is a dream. The goal mediates the relationship between the need and activity, and students' needs and desires are reflected in every goal they formulate. The goal, therefore, is a key component in students' ability to self-regulate.

Ivannikov maintained that in the process of self-regulated activity, the goal plays the following roles: (a) prognostic, as it predicts what kind of results can be obtained and explicates desired goals; (b) integrative, as it links together multiple components of the process of self-regulation; (c) guiding, as it channels students' attention and actions and influences selection of appropriate strategies; and finally (d) directing, as the goal provides the overall purpose for self-regulation. In the process of self-regulated learning, every goal comes through stages of formulation, clarification, verification and con- tinuous modification. Therefore, unlike Konopkin (1995), Ivannikov (1991, 1998) stressed the importance of motivational component in self-regulated learning.

A slightly different approach to conceptualization of the structure and functions of self-regulated learning was taken by Morosanova and colleagues (Morosanova, 1995, 1997a, 1997b, 1998; Morosanova & Konoz, 2000; Morosanova & Sagiev, 1994). She proposed a four-component framework of self-regulated learning and came up with a typology of styles of self-regulation of academic activities.

Morosanova's Framework of Self-Regulated Learning and Typology of Self-Regulation Styles

Morosanova and her colleagues (Morosanova, 1995, 1997a, 1997b, 1998; Morosanova & Konoz, 2000; Morosanova & Sagiev, 1994) described self-regulated learning as involving four components: planning, modeling, programming, and evaluation. *Planning* refers to students' ability to set academic goals, to initiate activity and to adjust goals in changing circumstances. *Modeling* involves effective selection of ac-

tions, tactics, and strategies to achieve desired goals, and construction of a model of actions assumed to lead to expected results. *Programming* is characterized by students' ability to follow a predetermined sequence of actions, to persevere despite possible failures and their ability to switch between several different sequences, or programs. *Evaluation* includes clear criteria of success, ability to assess obtained results and to judge their closeness to the desired goals.

The researchers derived and confirmed the model through careful application of various methodologies: observation, survey, and think-aloud protocols. First, Morosanova & Sagiev (1994) conducted an exploratory study inquiring into the nature of self-regulated learning. A series of observations allowed them to identify a list of items for further inclusion into the survey. This list went through several refinements, including eliminating redundancies, simplifying and clarifying wording. The resulting 56-item instrument was administered to a sample of 600 high school students and was subjected to thorough psychometric analysis. The four aforementioned components were derived through factor analysis and were tested for reliability and validity. The reported alpha coefficients ranged from .69 to .79, and were deemed by the researchers to be acceptable.

Content validity of their instrument was established through a Q-sort procedure. In order for an item to be accepted for construct validity, at least 80% of the experts (6 out of 7) had to place it into the same category. This procedure reduced the number of items to 46. The final instrument has become one of the most widely utilized instruments due to its facility in administration, interpretation and good psychometric characteristics (Dikaya, Semikin, & Schedrov, 1994; Morosanova, 1997b).

In more recent research, Morosanova and Konoz (2000) employed both think-aloud protocols and the survey to investigate self-regulated learning of 140 high school students. Think-aloud, considered a trace methodology, has an extensive history in cognitive psychology and cognitive science (Ericsson & Simon, 1993). The proven capacity of the think-aloud methodology to capture what students actually do in a dynamic, constantly changing learning situation provides support for the use of this tool to measure self-regulated learning (Dikaya et al., 1994; Morosanova, 1995; Winne & Perry, 2000). The transcripts of think-aloud protocols were coded deductively by two researchers, using the four components of self-regulated learning as coding categories. These data were used to calculate scores for each student on the four dimensions of the self-regulated learning. The scores were correlated with the results obtained on the self-report measure. The analyses showed a strong positive relationship between the two measures which allowed the researchers to make conclusions about the plausibility of the suggested model.

Additionally, Morosanova & Sagiev (1994) proposed that there are three personal styles that influence and play a role in the execution of each of the four structural-functional components of self-regulated learning. *Autonomy* refers to the degree to which students are able to set goals, find appropriate strategies, engage into self-judgment and self-evaluation and carry out goal-directed activity on their own, without relying on the outside help. *Flexibility* is characterized by students' ability to take into account circumstances and specifics of each particular learning situation, to quickly switch between strategies and adjust individuals' own behavior. *Stability* is defined as students' determination to initiate, stay on task, complete and evaluate the results, despite possible distractions and failures.

Based on the four identified components of self-regulated learning, Morosanova

(Morosanova, 1997a, 1997b; Morosanova & Konoz, 2000; Morosanova & Sagiev, 1994) developed a typology of these self-regulatory styles which were tested empirically on large samples of college and school-aged participants and proved to be stable. Using the four components of self-regulated learning, each style is described through identification of strong aspects or characteristics that facilitate educational success, and weak aspects or characteristics that represent poorly developed links of self-regulation and require compensation. The styles are labeled autonomous, operational, and stable. General descriptions of the three groups are presented in Table 1.

Table 1
Descriptions of Self-regulatory Styles

	Planning	Modeling	Programming	Evaluating
Autonomous	High ↑	High ↑	Medium —	Low ↓
Operational	Low ↓	Low ↓	High ↑	Medium —
Stable	High ↑	Medium —	Low ↓	High ↑

Autonomous students have high scores on planning and modeling, and low scores on evaluation. They can successfully set goals, define the order of steps and determine necessary actions to achieve them. Students with an autonomous style of self-regulation tend to have problems with self-judgment and evaluation of obtained results. Poor evaluation skills are compensated by very well developed planning and modeling, therefore learning situations are carefully planned in advance, and criteria for success are determined for every possible learning scenario.

An *Operational* style of self-regulated learning is characterized by high scores on programming and low scores on planning and modeling. Students identified as operational self-regulators have problems with specifying and adjusting goals of academic activity, as well as developing an arsenal of appropriate strategies and accounting for changing circumstances and conditions of a task. These shortcomings are compensated by high scores on the programming component with its persistence, ability to follow through on a task and to keep focus.

Finally, students identified as having a *stable* type of self-regulated learning have high scores on planning and evaluation and low scores on programming. The weakest link in self-regulation of learning activity for this group of students is compensated by careful formulation of hierarchies of goals and constant comparison of obtained results to well-specified criteria of success.

Morosanova's framework of self-regulated learning and in particular, her typology of self-regulatory styles makes her approach, perhaps, the most distinctive approach to self-regulation research. Morosanova (Morosanova, 1998; Morosanova & Konoz, 2000) stressed that planning, modeling, programming, and evaluation are always present in the process of self-regulated learning. However, students have different profiles of self-regulation with some components more developed then others.

Comparison of Models

It is clear from this review that there are commonalities as well as distinct features

among the six models. The final section of this paper examines these similarities and differences, and tries to organize and present them in a coherent fashion. To that end, Table 2 offers a summary of the comparisons, and then a figure is presented that tries to capture in a simple fashion the core of the commonalities, as well as highlighted areas of distinctiveness.

One reasonable place to start a comparison of the models is to look for their theoretical roots. Zimmerman's (2000) and Pintrich's (1996) models of self-regulated learning draw upon Bandura's (1986) social cognitive theory. In contrast, Winne's (1996) model seems to incorporate elements of various theories with an emphasis on the information-processing approach (Puustinen & Pulkkinen, 2001). Ivannikov (1991), Konopkin (1995), and Morosanova (1998, 2000) derived their models mostly from the Russian psychological literature. More specifically, in his work, Konopkin synthesizes ideas of classic Russian scholars, including Leontyev, Vygotsky, and Boz- hovich. At the same time he appears to have established his own niche in Russian psychology. He is well-known for his extensive theoretical work and produces a substantial body of theoretical essays and monographs. Ivannikov and Morosanova draw upon both classical and contemporary research, including that of Konopkin (Bozhovich, 1972, 1981; Konopkin, 1980; Leontyev, 1971; Shapkin, 1997; Vygotsky, 1960). However, their approach seems to be more empirical in nature.

Moving from origins to the theories themselves, four of the presented models describe self-regulated learning as a cyclical process, which includes a number of stages occurring in a sequentially-ordered fashion (see Figure 1). Morosanova (1997a; 1997b) and Ivannikov (1998) take a different stance, describing a number of components, or building blocks, of self-regulated learning, with no indication of the sequence in which the processes occur. However, whether or not a sequential order of components is stated, three highly similar components can be traced in each of the six theories. Although labeled differently by some researchers, they are conceptually similar and can be called planning, performance, and reflection. For Zimmerman and Ivannikov, these stages represent the main components of their models, whereas Winne's, Pintrich, Morosanova, and Konopkin include additional intermediate stages. A conceptual summary of the similarities and differences in the models is presented in Figure 1.

What we see in Figure 1 is that the researchers are in agreement on the notion that there is a preliminary phase in self-regulation that might be called planning, that sets up *what* is to be executed. Konopkin highlights the importance of goals and conditions of a task during this stage, whereas Winne delineates task definition and planning as two separate processes taking place during this initial phase. Similarly, Morosanova suggests that before performance (the second component of the model), people engage in both planning and modeling, with the former being defined as the ability to set goals, and the latter defined as individuals' construction of models for their actions.

All theorists concur that individuals move from the forethought stage to performance, or execution of the plan. Here, Pintrich emphasizes that there is monitoring that occurs during execution, with changes in the realization of the plan coming from that monitoring. Additionally, constant adjustment and selection of strategies characteristic of the control processes lead to refinement and alteration of individual performance. Pintrich claims that monitoring and control processes oversee the performance of the task, and sees them as different from the processes occurring during

the stage of reflection. Other researchers, however, seem to place monitoring into the next stage of self-regulated learning, reflection.

The third stage of the process of self-regulated learning has to do with reflection, involving assessment of the success of the activity, and subsequent refinement of how one looks at the tasks, and the execution of them. Konopkin emphasizes the notion that individuals have criteria for success, and their performance gets evaluated according to these criteria. He proposes that correction processes occur during this last stage, during which individuals attune their strategies and correct both their actions and their original goals. For Konopkin, criteria for success, evaluation, and correction represent independent stages in the process of self-regulation, whereas other researchers view them as occurring within the reflection stage.

The arrows on the model shown in Figure 1 indicate the circular recursive nature of self-regulated learning. The researchers are in agreement that every stage influences and is influenced by every consecutive stage. Note that there are interesting refinements or elaborations that do not fit easily into a unified, comprehensive model. Examples of this are Winne's notion that self-regulation can be viewed as an aptitude or as a task, and Morosanova's notion of styles of approaching tasks within an overall self-regulatory model.

Obvious differences in definitions of self-regulated learning, general terminology and considerations of related concepts do not truly distinguish the models. For instance, five of the described models stress the importance of goals and define self-regulated learning as a goal-directed process (Ivannikov, 1998; Konopkin, 1995; Morosanova, 1997a; Pintrich & Zusho, 2002b; Zimmerman, 2002). Ivannikov (1998) went further and described a list of functions that goals serve for the process of self-regulated learning to be effective. Although Winne (1996; Winne & Jamieson-Noel, 2003) does not include the notion of goals in his definition, he does imply that self-regulated learners are goal-oriented and carry out and adjust their actions according to task demands and pre-established requirements. Similarly, neither Winne (1996) nor Konopkin (1995) dedicate significant attention to motivation. This may be a matter of other factors given closer consideration by these researchers, rather than an explicit denial of the importance of motivation for successful self-regulation.

Five of the described researchers emphasize the crucial role of context in self-regulated learning (Ivannikov, 1998; Konopkin, 1995; Morosanova, 1997a; Pintrich & Zusho, 2002; Zimmerman, 2002). Pintrich (2000), Zimmerman (2002) and Ivannikov (1998) suggest that individuals adjust their self-regulatory skills depending on the context. Morosanova (1997b) and Konopkin (1995) state that a properly organized environment will have a salutary effect on students' ability to self-regulate. Winne (1996) doesn't address the role of context in his writings.

Winne (1997) offered two distinct views on self-regulation: as an aptitude and as an event. The other researchers do not articulate such a division in their writings. How- ever, their choices with regard to methodology when investigating the phenomenon is indicative of the view to which each researcher adheres. For instance, Winne, along with Zimmerman, Pintrich, Morosanova, and Ivannikov used self-report question- naires when studying self-regulated learning. Such an approach suggests that a single measurement is possible because it assesses an aptitude that is relatively stable (e.g., Winne & Perry, 1999). Thus, students' self-perceptions of their self-regulation may be captured to determine their self-regulation when learning. The obtained score of self- regulation is an aptitude, believed to be stable across contexts

and tasks.

A common criticism of approaches to measuring self-regulated learning as an aptitude is that they measure students' self-perceptions of their self-regulated learning, but may not be able to capture the dynamic nature of self-regulated learning. Additionally, students may not always be able to accurately recall their use of strategies. That is why Zimmerman (2002), Ivannikov (1991), and Pintrich (2000) derived and further substantiated their models through observations, teachers' surveys and interviews. Such triangulation allowed them to establish their models of self-regulated learning while compensating for possible shortcomings of survey research.

To capture the dynamic nature of self-regulated learning, some of the researchers employed trace methodology in their studies. Winne (1997) used computer software to record traces of self-regulatory activities that students engaged in, and Morosanova & Konoz (2000) utilized think aloud protocols to study students' ongoing cognitive processes. In both cases, following Winne's (1997) dichotomy, self-regulated learning was regarded as an event. Trace methodology has proven to be quite powerful in examining self-regulated learning (Azevedo, Guthrie, & Seibert, 2004), but there are potential pitfalls. For instance, thinking aloud while engaged in performing a task may alter the sequence of thoughts. Another potential weakness is the variability that may exist in the participants' ability to verbalize their thoughts while engaged in a task. Having taken into account advantages and disadvantages of trace and self-report approaches, Morosanova (2000) and Winne (1997) employed both methodologies and compared the results. Overall, the researchers employed sophisticated methodologies to investigate self-regulated learning and by combining different approaches, develop- ed powerful models.

The Russian and the American researchers appear to be working independently on furthering the understanding of the nature and characteristics of self-regulated learning, as no cross-references were found between the two camps. An analysis of a wide range of sources in both languages reveals an interesting trend: The American researchers report many more empirical studies as compared to their Russian counterparts. Konopkin and Morosanova, for example, both well-known and well-regarded experts on the issue of self-regulation, are quite prolific and have published numerous works on the issue. However, most of their publications are theoretical analyses of the phenomenon. It is not known whether this trend holds in other areas of educational psychology research and whether it is a part of culture in the Russian academic world. After all, we know that Vygotsky's and Leontyev's endowment is represented by vast theoretical work which was investigated and confirmed (or refuted) later on through empirical studies by their fellow researchers.

In general, the differences among the six models diminish as the models are examined in more detail. Dissimilarity lies mostly in the relative weight attributed to the component parts, more than in the actual components themselves. The authors seem to 'slice' self-regulated learning along different vectors, agreeing on its main attributes. Table 2 summarizes the models and allows for comparison of similarities and differences.

CONCLUSION

Our goal here has not been to resolve the issues involved in the differences among these models, nor to provide a critique of the strengths and weaknesses of the various models. Rather, we have tried to introduce to readers the scholarship on the topic that

Russian scholars have been developing and show the similarities and differences to popular American approaches. We see a number of strong similarities between the two strands of research, although we note at the same time that there does not seem to have been much cross-fertilization to date among scholars in the two countries. We hope that this presentation may serve to begin to bridge that chasm.

Table 2

Comparison of Theories

	Winne	Pintrich	Zimmerman	Konopkin	Ivannikov	Morosanova
Definition	SRL is a metacognitively guided behavior which allows students to adjust and control the use of cognitive strategies and tactics when attempting a new task	SRL is an active process in which students set goals for their learning and strive to monitor and regulate cognition, motivation, behavior and context to achieve those goals	SRL is a system of thoughts, feelings and actions that are planned and continually adjusted to better attain one's goals	SRL consists of well-defined functional links that carry out specific regulatory functions to achieve one's learning goals	SRL is a conscious mental effort channeled towards achieving desired predetermined goals	SRL is a system of cognitive components and personal characteristics that are geared toward achievement of goals
Type of Model	*Recursive*: SRL is viewed as having a cyclical structure in which feedback from one stage influences all other stages	*Recursive*: In SRL, monitoring, control and reflection occur dynamically as the student progresses through the task	*Recursive*: SRL is cyclical in nature in which the output from each stage affects the process of every other stage	*Recursive*: All links in this cyclical model interact and jointly carry out the process of self-regulated activity in an effort to reach a desired goal	*Component*: There is no implication of the order that stages come into play	*Component*: All components are always present; there is no indication of the sequence
Phases or components	(1) Task definition; (2) Planning; (3) Enactment; (4) Analysis	(1) Forethought; (2) Monitoring; (3) Control; (4) Reflection	(1) Forethought; (2) Performance; (3) Self-reflection	(1) Goals; (2) Conditions; (3) Actions; (4) Criteria for success; (5) Control and evaluation; (6) Correction	(1) Motivational block; (2) Executive block; (3) Evaluative block	(1) Planning; (2) Modeling; (3) Programming; (4) Evaluation
Is motivation considered?	NO	YES	YES	NO	YES	YES
Are goals considered?	NO	YES	YES	YES	YES	YES
Is context considered?	NO	YES	YES	YES	YES	YES
Unique feature	Each stage of SRL has the same general structure and consists of (a) onditions, (b) perations, products, (c) evaluations, (d)standards	Each phase includes self-regulatory activities that pertain to (a) cognitive, (b) motivational/ affective, (c) behavioral and (d) contextual areas	SRL is determined by three separate yet interconnected factors: (a) personal, (b) behavioral and (c) environmental events	Proposed most elaborate system of components of SRL	Proposed three dimensions which help students direct and sustain their investments in learning: (a) significant relationships; (b) personal importance; (c) background	Each component is influenced by three personal characteristics: autonomy, flexibility and stability Proposed a typology of self-regulatory styles

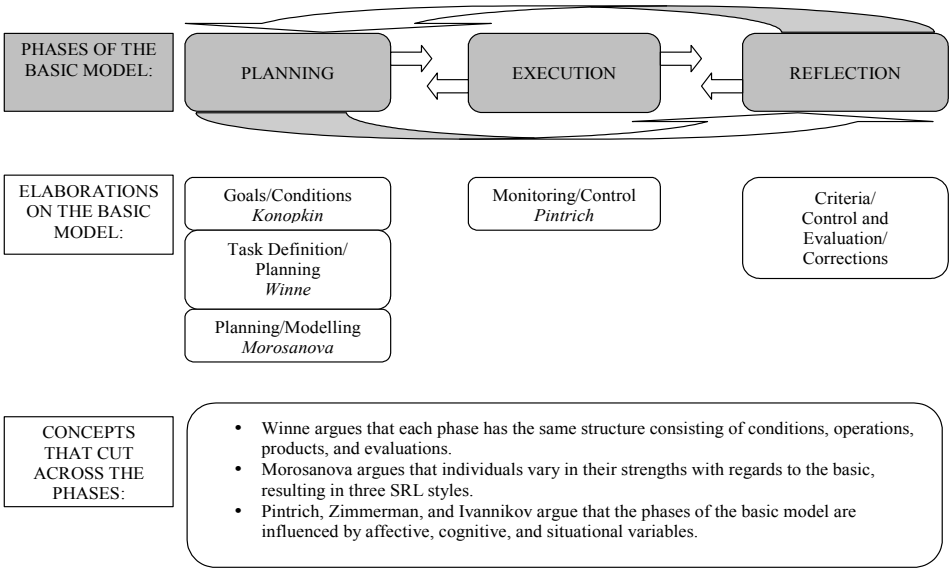

Figure 1. The Underlying Structure of the Six Models of Self-regulated Learning.

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