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Abstract

Self-regulated learning (SRL) is viewed as an important aspect of student academic performance and achievement. The aim of our research was to study, measure and enhance students self-regulated learning skills. Additionally, a certain learning environment and a training program were to be created. The participants in this study were 104 first year university students at the Kazan Federal University, the Institute of International Relations, History and Oriental Studies. Data were gathered twice by administering the Motivated Strategies for Learning Questionnaire (MSLQ), before and after the intervention. The intervention was focused on enhancing SRL skills within a period of 9 months. The results showed that the mean scores in the treatment group improved after the interventions, while mean scores in the control group remained practically on the same level. Summarizing the results, we can affirm that the interventions had an effect on SRL. The interventions included promotion of cognitive, metacognitive, and/or motivational strategies and focus on strategy application or benefit.

Keywords

Self-regulated learning – Methods of assessment – Learning strategies – SRL interventions

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Introduction

The concept of self-regulated learning refers to the process for learners taking the initiative to adjust the cognition, emotion and behavior in order to enhance the learning effect and achieve learning goals.

Central to this concept are the autonomy and responsibility of students to take charge of their own learning. Self-regulated students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on others, such as teachers, parents, or other agents of instruction. Thus self-regulated learning is viewed as an important aspect of student academic performance and achievement in classroom settings.

The aim of our research was to study, measure and enhance students self-regulated learning skills in Kazan Federal University. Additionally, a certain learning environment and a training program were to be created.

Over the past 30 years, the concept of self-regulated learning has been embraced and heavily researched, with many educational psychologists proposing theoretical models and setting up studies to test the theories and provide pragmatic information about self-regulated learning.

We chose to analyze and work with Pintrich model of SRL (2000) as, first, the questionnaire based on it, the Motivated Strategies for Learning Questionnaire (MSLQ) is widely used, and, recently, two reviews have found that the MSLQ is the most used instrument in SRL measurement, and, second, this SRL-measurement instrument was appropriate for our further research.

According to Pintrich model, SRL is compounded by four phases: (1) Forethought, planning and activation; (2) Monitoring; (3) Control; and (4) Reaction and reflection. Each of them has four different areas for regulation: cognition, motivation/affect, behavior and context. That combination of phases and areas offers a comprehensive picture that includes a significant number of SRL processes (e.g., prior content knowledge activation, efficacy judgments, self-observations of behavior)

One of the strengths of the questionnaire based on the model is its combination of SRL and motivation, which offers detailed information about students' learning strategies use. Two versions of the questionnaire have been developed for college and high school. The version we chose is for college and it consists of 81 questions composed into 15 scales and divided into a motivation section with 31 items, and a learning strategies (SRL) section with 50 items which are subdivided into three general types of scales: cognitive, metacognitive, and resource management. See table 1.

The fifteen different scales on the MSLQ can be used together or singly. The scales are designed to be modular and can be used to fit the needs of the researcher or instructor. The instrument is designed to be given in class and takes approximately 20-30 minutes to administer. Students rate themselves on a seven point Likert scale from "not at all true of me" to "very true of me." Scales are constructed by taking the mean of the items that make up that scale.

Scales		Sub-scales	
Motivation	Value Components (reasons why students engage in an academic task)	1	Intrinsic Goal Orientation (a focus on learning and mastery)
		2	Extrinsic Goal Orientation (a focus on grades and approval from others)
		3	Task Value (judgments of how interesting, useful and important the course content is to the student)
	Expectancy Components (refers to students beliefs that they can accomplish a task)	4	Control Beliefs (the extent to which they are able to control or influence outcomes)
		5	Self-Efficacy for Learning and Performance
	Affective Components	6	Test Anxiety (students' worry and concern over taking exams)
Learning Strategies	Cognitive and Metacognitive Strategies	7	Rehearsal (repeating the words over and over to oneself to help in the recall of information)
		8	Elaboration (paraphrasing, summarizing)
		9	Organization (outlining)
		10	Critical Thinking (apply previous knowledge to new situations or make critical evaluations of ideas)
		11	Metacognitive Self-Regulation (use of strategies that help students control and regulate their own cognition)
	Resource Management Strategies (students' regulatory strategies for controlling other resources besides cognition)	12	Time and Study Environment (using their time well, having an appropriate place to study)
		13	Effort Regulation (persisting in the face of of difficult or boring tasks)
		14	Peer Learning (using a study group or friends to help learn)
		15	Help Seeking (seeking help from peers or instructors when needed)

Table 1
Motivated Strategies for Learning Questionnaire (MSLQ) scales

Methods

The participants in this study were 104 first year university students at the Kazan Federal University, the Institute of International Relations, History and Oriental Studies.

Data were gathered twice by administering the Motivated Strategies for Learning Questionnaire (MSLQ), before and after the intervention. The intervention was focused on enhancing SRL skills within a period of 9 months. The school subject in which context the intervention took place was a Foreign Language (English). Length of the intervention was 9 months performed weekly during lessons according to students' time-table. Interventions

were integrative with different aspects of learning, including metacognitive and motivational aspects and combined the instruction of different types of strategies.

Results and discusión

In the first step of our study we selected two groups of students. As mentioned above Motivated Strategies for Learning Questionnaire (MSLQ) was used to measure and to evaluate the impact of the interventions on SRL skills. After administering MSLQ for the first time one group of students showed lower mean scores than the other, thus we selected this group to perform the interventions in, and it became the treatment group and the other was the control group, all attended the same institute, were of the same age. The treatment group consisted of 50 students, the control group consisted of 52 students. The data regarding SRL of the two groups were analysed together. They are presented in Table 2.

MSLQ subscales		Before intervention				After intervention			
		Treatment Group		Control group		Treatment Group		Control group	
		M	SD	M	SD	M	SD	M	SD
1	Intrinsic Goal Orientation	5.11	1.13	5.85	0.78	6.41	0.58	6.08	0.71
2	Extrinsic Goal Orientation	4.75	1.03	4.91	1.56	6.04	0.62	5.23	1.14
3	Task Value	4.91	1.04	5.84	1.02	6.27	0.77	6.01	0.90
4	Control Beliefs	5.18	0.99	5.67	1.18	6.17	0.63	5.89	0.93
5	Self-Efficacy for Learning and Performance	4.99	0.78	5.67	1.12	6.115	0.70	5.74	0.89
6	Test Anxiety	3.328	0.94	3.41	1.35	2.884	0.87	3.30	1.10
7	Rehearsal	4.43	1.07	4.69	1.17	5.82	0.62	5.01	1.24
8	Elaboration	4.56	0.85	5.15	1.04	5.96	0.70	5.34	1.04
9	Organization	4.815	0.99	4.96	1.24	6.14	0.70	5.10	1.13
10	Critical Thinking	4.368	0.78	4.55	1.07	5.824	0.70	4.82	1.19
11	Metacognitive Self-Regulation	4.13	0.83	4.57	0.95	5.74	0.62	4.68	1.09
12	Time and Study Environment	4.485	0.81	4.92	1.10	5.76	0.73	4.96	1.07
13	Effort Regulation	4.25	1.13	4.63	1.19	5.75	0.80	4.63	1.11
14	Peer Learning	3.77	1.08	3.47	1.21	4.8	0.63	3.81	1.10
15	Help Seeking	4.45	0.94	4.30	1.40	5.58	0.50	4.21	1.16

Table 2
SRL before and after the interventions

One-sided t-tests was used to indicate if a difference was significant while administering data. The results showed that the mean scores in the treatment group improved after the interventions, while mean scores in the control group remained practically on the same level.

Summary

The present study found that self-regulated learning skills can be enhanced with an appropriate training program.

The intervention was conducted by us being regular teachers, thus we had the possibility to link the training program to our regular teaching which helped to foster students' SRL skills within the academic context.

The interventions were focused on the following types of strategies of self-regulated learning:

1.- Cognitive strategies. Cognitive strategies refer directly to the treatment of the learned information:

- Repetition strategies: active repetition improves the chance that information will be memorized by transfer to the long-term memory. To remember information, simple repeating without any further understanding of the content does not lead to gain meaning from the material or to process it in a deeper sense.
- Elaboration strategies: these serve to support the comprehension process by incorporating new knowledge into already existing cognitive structures. Meaningless contents will be assigned meaning in order to retain it more efficiently.
- Organizational strategies: these seek to work out and illustrate important information and relations by grouping single information into super-ordinate units of meaning in order to be processed and memorized more efficiently.
- Problem solving strategies: they aim at resolving a problem if there is no obvious solution at hand. Within problem solving, a problem is fragmented into sub-goals, which can be solved with the available means.

2.- Metacognitive strategies. Metacognitive processes can therefore control, monitor and regulate learning and cognitive activities in general. Thus, metacognition enables reflection about one's own learning process on the one hand, and use and regulation of strategic activities on the other hand.

3e.- Motivation strategies. The above-described cognitive and metacognitive strategies suggest characteristics about effective and self-regulated learning behavior. However, whether these strategies will be applied also depends on the motivational conditions. These play a significant role as they influence the initiation and maintenance of learning behavior. Applying self-regulatory strategies may cost students more time and effort than their normal learning. It is therefore important for them to be motivated to use these strategies.

Since interventions with curriculum unrelated tasks generate very little transfer to academic achievement, most researchers now agree that teaching strategies should not be separated from the learning context. This implies that either curriculum related tasks are used or that interventions are integrated in regular school activities.

The current study not only shows the benefits of SRL, but also illustrates the need for including SRL in the school curriculum, as a means for improving learning in all students. Based on this study we acknowledged the utility of the intervention and reported changes in the students' behaviors. Further studies about the effects on the teachers and the way in which they adapt their teaching, i.e. making it more metacognitive, is under investigation.

Conclusions

Summarizing the results, we can affirm that the interventions had an effect on SRL. The interventions included promotion of cognitive, metacognitive, and/or motivational strategies and focus on strategy application or benefit. The highest effects were found for interventions that combined the instruction of different types of strategies. Interventions should be integrative and consider various different aspects of learning, including metacognitive and motivational aspects. Interventions should provide students with knowledge about strategies and benefits of applying the strategies, or additionally also stimulated metacognitive reasoning. Also we found it effective to provide students with feedback about their (strategic) learning. In addition, the instruction of action control strategies influenced positively students' strategy use. This is related to the strategies of metacognitive reflection, and might be most efficient because it is very close to the concrete learning content and strategy use.

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