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THE EFFECT OF META-COGNITIVE STRATEGIES ON SELF-EFFICACY AND LOCUS OF CONTROL OF GIFTED IN FOREIGN LANGUAGE LEARNING

Summary: Locus of control and academic self-efficacy are significant variables in foreign language learning that influence advancement in language acquisition and cognition, as well as building language skills. Previous research in the field of foreign language teaching has been partly related to cognitive and meta-cognitive learning strategies of gifted students. However, self-efficacy and locus of control of gifted have not been studied in our country, yet. This study investigates the effects of cognitive and meta-cognitive strategies on locus of control and self-efficacy of university students gifted in foreign language learning. The survey was conducted on a sample of 39 engineering students. The results show that cognitive strategies have significant and positive effects on academic self-efficacy, while meta-cognitive strategies have significant and positive effects on locus of control of gifted students.

Key words: gifted, cognitive strategies, meta-cognitive strategies, locus of control, academic self-efficacy.

1. INTRODUCTION

Learning strategies are specific learning approach and mental processes, which students use to advance their foreign language knowledge. Thus, the learning strategy is essentially neutral until the context of its application is studied. What makes the strategy positive and useful for the student is that: (a) it should focus on the foreign language learning tasks; (b) it should match the students' particular preferences in learning, and (c) the student chooses and uses an effective strategy and associates it with other relevant learning strategies. Strategies that meet these conditions enable easier, faster and more enjoyable learning which is transferrable, efficient, and more focused on new situations (Oxford, 1990).

Learning strategies also help students to become independent and enable them for lifelong learning (Little, 1991). However, students are not always aware of the advantage and great potential of these strategies, the application of which in foreign language learning provides successful results (Nyikos and Oxford, 1993). Therefore, they should be directed towards developing awareness of advantages of using learning strategies and instructed how to use a wider range of corresponding strategies. They are used consciously and intentionally, and their application is controlled by the student.

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1.1. Cognitive and meta-cognitive strategies

Cognitive learning strategies include strategies of repetition (taking notes, labeling, underlining), strategies of elaboration (paraphrasing, summarizing, analogy making, answering questions), and organizational strategies (extracting the essence, sketches, mind maps). Cognitive strategies are predictors of good mastering foreign language which has been confirmed by a number of studies (Magogwe & Oliver, 2007; Magno, 2010; Su & Duo, 2012; Oxford & Ehrman, 1995; Park, 1994). Flavell (1985) believes that cognitive process begins with emotional stimulation and continues with recalling the data contained in our memory. Since these processes are related to knowledge and recognition, they are called cognitive processes. In other words, recognition occurs when we identify or remember something, understand a sentence, express our idea or solve a problem.

Meta-cognitive strategies include strategies of planning (setting goals, following-up the set and accomplished tasks, asking questions), strategies of evaluating (self checking, attention focusing, following-up the understanding), and strategies of centring (adapting learning speed, re-learning, repetition, response strategies). Meta-cognitive learning strategies include meta-cognitive self-regulation and critical thinking (Pintrich, 2003).

Students achieve higher in foreign language learning if cognitive and meta-cognitive strategies are used often and in large numbers. These are important factors that help in learning and recalling the already acquired knowledge. These strategies can also be learned or mastered if exercised for a longer period of time (Seif, 2011). Regardless of the strategies students use, they will be more successful in solving linguistic tasks, reading, understanding or seeking additional information when teachers provide specific instructions, that enable them to improve their meta-cognition. Students aware of their learning strategies when reading, listening, speaking and writing, and who consciously choose their activities to improve their language skills are more successful than students who are less aware of them (Liyanage & Bartlett, 2013). Term recognition refers to internal mental processes. In other words, it is the way in which information is considered, recognized, encoded and stored in memory, and then used when needed. Successful language mastering implies knowledge, an adequate way of organizing, storing, and re-using the acquired knowledge through basic language skills. Dornjei (Dornyei, 2006) suggests that cognitive strategies include different ways in which people control their learning, memorizing and thinking. Hendry (Hendry, 2000) defines cognitive strategies as a variety of approaches to problem solving and critical thinking, and refers to cognitive strategies as explorations of processes of information processing, since in the process of information retention individuals require external stimuli, i.e. educational and creative activities, to be regulated.

Flavell (1979) points out that a wide spectrum of cognitive production occurs through actions and reactions of four classes of phenomena: meta-cognitive experience, meta-cognitive knowledge, tasks and goals, and actions and strategies. Meta-cognitive knowledge and meta-cognitive abilities relate to student awareness of their cognitive processes (memory, thinking, observation), and the awareness of when and in which situations specific learning strategies can be more effective and better than others, which may be more effective in other situations and for solving other problems (Gojkov, 2009; Gojkov and Stojanović, 2011). In addition, students with higher abilities to control and monitor their own cognitive processes, as well as their own learning and problem solving strategies, usually achieve better results in learning. Students with a well developed ability to control their learning strategies, as well as the

course and achievements in learning in general, are able to control the learning process from the beginning to the end, which makes this type of learning deeply meaningful and target-oriented (Gojkov et al. 2014).

1.2. Locus of control

The concept of locus of control has been introduced by Julian Rotter (1966), and it refers to people's beliefs about the dependence of events in their lives – i.e. whether they result from their personal actions or they are the result of a random network of circumstances, predestination, or destiny.

People who believe that events in their lives primarily depend on their own actions are considered to have internal locus of control, while those who believe that their life primarily depends on external influences are considered to have external locus of control. Thus, people can have an extremely high internal or external locus of control, or a moderate internal or external locus of control, which significantly affects the way they are motivated (Findley & Cooper, 1983).

Namely, the success in student motivation depends on whether we have properly assessed what is important to them in life, and provided them with what can motivate them, that is, with what requires additional effort. The necessary knowledge and demarcation of individual differences among students is the first step in their successful motivation. However, their individual differences cannot be fully satisfied, because teachers do not offer everything that could be offered. Instead they shape their offer in relation to students' attitudes (Karaman & Watson, 2017).

1.2.1. Differences in attitudes among people with internal and external locus of control

Studies have shown that people with internal locus of control have a much more pronounced need for achievement, expertise, high standards, challenging goals, control, and independence (Phares, 1976). In this sense, with maturation and gaining life experience, internal locus of control grows, reaching the age when it starts to shift back towards the external locus. Accordingly, internal locus of control prevails among the accomplished people (Rotter, 1990).

Studies have shown that internal locus of control prevails more among men than women. In addition, there are also cultural differences to be considered, e.g. the external locus of control is much more pronounced among the people of Japan than among the people of America (Lonky & Reihman, 1980).

Bearing in mind these characteristics, and if the teaching activity is aimed at building a proactive attitude in students, which implies taking initiative and higher levels of personal responsibility, we develop the internal locus of control (Albert & Dahling, 2016). It is therefore important for students to be motivated in a way that enables them to influence the decision on how and when they will be rewarded. In this regard, the best system of rewarding is related to teaching activities and enables students to participate in assessing their own knowledge and creating their own learning plans. Students with internal locus of control are additionally motivated if they can choose the type of reward, as well as if they know the type

of reward of their success in advance, that is, if they know that there is a consistency in the sense that it all depends on them (Wesely, 2012).

Internal locus of control seems more desirable and healthier, as it gives the impression that we can influence the outcome of our work, which makes the student proactive and more success oriented. However, the opinion that the internal locus of control is good and the external is bad is a simplified view of this complex phenomenon. If the internal locus of control is not accompanied by proper responsibility, self-efficacy and ability, the student can face anxiety in the learning process. On the other hand, students with external locus of control and high expectations can also experience discomfort and increased anxiety (Karaman & Watson, 2017).

We think that beliefs are created under the influence of external circumstances, through the process of education, and once formed, they affect student behaviour. We can influence some events in the teaching process, but not everything. It is necessary to differentiate these events well and create a good balance between the internal and external locus. In addition, based on specific methodological approaches and training, the locus of control can be shifted (Karaman & Watson, 2017). Previous research on the locus of control and meta-cognition suggests that they are closely related to academic success, and that students can be taught how to improve their success (Albert & Dahling, 2016).

1.3. Academic self-efficacy

In socio-cognitive theory (Bandura, 1986), cognitive processes play a decisive role in human behaviour, and there are studies focused on students' self-efficacy as a significant factor of success. Bandura has defined self-efficacy as individual's perception of the level of control he/she has during his/her lifetime, given that people are trying to control events that affect their lives. When choosing among the options offered, students can have a certain control over events and a greater chance of achieving the intended goal and avoiding failure. When self-efficacy increases, success in language learning also increases, and students demonstrate greater persistence and willingness to work compared to students with lower self-efficacy (Scherer, 2013). Primary self-efficacy in foreign language learning is related to talent, social support, and previous learning experience.

Students who have planned and managed their learning process or task preparation will continue the same practice in future, and constantly throughout their lives (Pajares & Schunk, 2001). In his study on the relation between student self-efficacy and success, Muktari (2002) concluded that there is a significant relationship between these variables, and that there is no significant difference in self-efficacy between male and female students. Mills (Mills, 2009) reported that self-efficacy positively affects students' mental health and their academic success. Koslowsky and Smadar (2009) have studied the relationship between teachers' self-efficacy and group activities, and concluded that there is a significant relation.

Another study (Shores & Shannon, 2007) showed that self-regulated students achieve better results. Positive beliefs regarding the own abilities or a high sense of academic self-efficacy are very important factors and components of self-regulation. Self-efficacy affects how people think, feel, behave, and motivate themselves. Students' perception of self-efficacy refers to self-monitoring and academic achievement and motivation (Shores and Shannon, 2007). Results of the study have shown that attributing academic success to one's own efforts

increases the level of student self-efficacy, encouraging thereby the adoption of a self-regulated learning strategy (Ferla et al. 2008). In addition, students with a constructive learning concept have more properties related to the internal locus of control. They:

- attribute academic success to their own efforts,
- have higher self-efficacy,
- use more internal and external regulatory strategies,
- rarely believe that their study has no course or purpose,
- and they are more likely to use deep learning and strategies of deep and surface data processing (Ferla et al. 2008).

2. METHOD

2.1. Research subject and objective

The subject of this research is the influence of cognitive and meta-cognitive strategies on locus of control and self-efficacy of gifted university students. In the context of university education of gifted students, self-efficacy and locus of control represent important and influential independent variables affecting the achievement and performance in foreign language learning.

This study aims to explore the effects of cognitive and meta-cognitive strategies on locus of control and self-efficacy of gifted students.

Research hypotheses:

1. Cognitive strategies have a significant impact on the locus of control of gifted students.
2. Cognitive strategies have a significant impact on the self-efficacy of gifted students.
3. Meta-cognitive strategies have a significant impact on the locus of control of gifted students.
4. Meta-cognitive strategies have a significant impact on the self-efficacy of gifted students.

2.2. Sample

The sample consisted of 39 gifted students from the Faculty of Technical Sciences in Novi Sad. The average age of students was 21.56 years ($SD = 1.65$), with 61.58% ($N = 24$) of the sample consisting of female respondents. Participants voluntarily filled in the questionnaire and have given their consent to participate in the research during the 2017/2018 winter semester.

2.3. Research concept

This is an exploratory research, with the data being collected using a questionnaire. The distributed questionnaire consists of several parts. The first part consists of questions regarding the respondents' socio-demographic characteristics. The second part contains two scales relating to the application of cognitive and meta-cognitive strategies in foreign language learning (Oxford, 1990). This is followed by a questionnaire on the academic locus of control (Rotter, 1975), while the fourth part consists of questions regarding academic self-efficacy (Wang, 2014). Statistical analyses were carried out using the IBM SPSS Statistics 22 software, a comprehensive computing program used for fast and accurate data processing. Linear regression was used for data analysis.

2.4. Instruments

1. *Strategic Inventory for Language Learning (SILL) (Oxford, 1990).*

Initially, there are two versions of SILL, one for English speakers who learn a foreign language (version 5.1), and one for speakers of other languages who learn English as a foreign language (version 7.0). This research uses the SILL 7.0 version. The questionnaire was translated into Serbian language in order to obtain more accurate results. Three teachers of English language working at the University of Novi Sad translated the original questionnaire into Serbian. Out of the three translations, the most accurate and best translated items were selected based on a joint assessment, from which the Serbian version of the scale was constructed. Then, in order to verify the validity of the translation, a native speaker (translator) translated the Serbian translation back into English, and the one that best suited the original was taken for use.

SILL 7.0 measures the frequency of using strategies for foreign language learning and examines six strategies: memory (9), cognitive (14), compensatory (6), meta-cognitive (9), affective (6) and social (6), which makes a total of 50 questions.

This research uses the *cognitive strategy subscale*, which consists of 14 questions related to the meaningful use of teaching material, analysis of needs, taking notes, summarizing, synthesizing, emphasizing, reorganizing the information, developing the knowledge structure, using the language in a natural environment (communication with a native speaker, visiting the native speaker's country), and exercising linguistic structures and pronunciation. This subscale was found to have good reliability ($\alpha = .78$).

The *subscale of meta-cognitive strategy* has also been used in the research, which consists of 9 questions relating to the management of learning process in general. The questions relate to the identification of one's own style of learning and needs, task planning, collecting and organizing materials, arranging learning space and work schedule, managing errors, assessing success in resolving tasks and evaluating successfully applied learning strategies. The Cronbach alpha for this scale is .85.

2. *Self-Efficacy of English Foreign Language Students Questionnaire (Wang, 2014)*

The questionnaire was designed with the aim of determining students' self-efficacy in foreign language learning. It contains 31 questions pertaining to students' opinion of their own language abilities and consists of four subgroups of questions relating to four language skills: self-efficacy in listening, self-efficacy in speaking, self-efficacy in reading, and self-efficacy in writing. Each question was answered by highlighting the answers on a scale of 1-7 (from *definitely unable* to *definitely able*)

Three teachers of English language working at the University of Novi Sad translated the original questionnaire into Serbian. Out of the three translations, the most accurate and best translated items were selected based on a joint assessment, from which the Serbian version of the scale was constructed. Then, in order to verify the validity of the translation, a native speaker (translator) translated the Serbian translation back into English, and the one that best suited the original was taken for use.

The self-efficacy questionnaire was found to be very reliable ($\alpha = .98$).

3. Locus of Control Scale (Rotter, 1975)

The academic locus of control scale (Rotter, 1975) was used to measure the locus of control of participants in the study. The author of the scale believed that more accurate measurements could be obtained by deviating from the general approach to the concept of locus of control and adjusting the control instrument to the specific field being examined. The scale has been designed to predict a wide range of student behaviours, and was answered by choosing between the statements of "correct" and "incorrect". The author's (Rotter, 1975) desire was to create an instrument with high reliability and validity in relation to the instrument that measures the general locus of control.

Three teachers of English language working at the University of Novi Sad translated the original questionnaire into Serbian. Out of all three translations, the most accurate and best translated items were selected based on a joint assessment, from which the Serbian version of the scale was constructed. Then, in order to verify the validity of the translation, a native speaker (translator) translated the Serbian translation back into English, and the one that best suited the original was taken for use.

The questionnaire relating to the academic locus of control was found to be reliable ($\alpha = .76$).

3. RESULTS

3.1. Descriptive statistics

The results of descriptive statistics (Table 1) indicate that there were no univariate deviations from the normal distribution in variables, since values of asymmetry of distribution of results (skewness) and the kurtosis of distribution of results were in the range of ± 1.5 (Tabachnick and Fidell, 2013).

Table 1: Descriptive statistics for main variables

Scale	Min	Max	AS	SD	Skewness	Kurtosis
Meta-cognitive strategies	15	43	32.16	6.73	-.43	-.29
Cognitive strategies	18	60	41.44	8.51	-.20	.33
Academic locus of control	3	23	11.22	3.83	.58	.38
Academic self-efficacy	64	214	170.94	34.64	-1.06	.37

Note: Theoretic range of scores: 9 – 45 for meta-cognitive scale; 14 – 70 cognitive scale; 0 – 28 for academic locus of control; 31 – 217 for scale of academic self-efficacy.

3.2. Relations between learning strategies and self-efficacy, and locus of control

Two multiple regression analyses were conducted in order to examine the predictive role of learning strategies in relation to locus of control and self-efficacy of gifted students. The regression models are summarized in Table 2. Both models were statistically significant and explain 18% of variance in self-efficacy and 5.7% of variance in locus of control.

Table 2: Summary of regression models

Criterion	R ²	F	df1	df2	p
Academic self-efficacy	.181	11.61	2	39	.000
Academic locus of control	.057	3.15	2	39	.047

Values of beta coefficient are presented in Table 3. For the self-efficacy of cognitive strategy, they proved to be significant predictor, while for meta-cognitive strategies they have not reached a statistically significant value. This is a positively oriented relation, which means that higher frequencies of using cognitive strategies are accompanied by higher self-efficacy. When it comes to locus of control, the meta-cognitive strategy is a significant predictor. This relation is negatively oriented, and since better results across the scale of locus of control indicate higher external locus, this means that higher use of meta-cognitive strategy is associated with a higher internal locus.

Table 3: Relative predictive power of learning strategies for self-efficacy and locus of control

Predictor	Criterion					
	Self-efficacy			Locus of control		
	β	t	p	β	t	p
Metacognitive strategies	.114	1.02	.308	-.259	-.22	.032
Cognitive strategies	.347	3.12	.002	.038	.32	.750

Research hypotheses

- N1. Cognitive strategies significantly affect the locus of control of gifted students has been rejected.
- N2. Cognitive strategies significantly affect the self-efficacy of gifted students has been confirmed.
- N3. Meta-cognitive strategies significantly affect the internal locus of control of gifted students has been confirmed.
- N4. Meta-cognitive strategies significantly affect the self-efficacy of gifted students has been rejected.

4. DISCUSSION

According to the obtained results, meta-cognitive learning strategies do not affect the increase of self-efficacy of gifted students, as opposed to cognitive strategies, which do so. Cognitive strategies enable gifted students to manipulate language, for example, through rationalizing, analyzing, noting, summarizing, synthesizing, reorganizing information for better structuring of knowledge, as well as exercising in natural environment. Moreover, gifted students who focus more on structured knowledge, analysis, deeper learning and higher self-efficacy in academic achievements are more likely to use cognitive strategies. These findings are in line with Magogwe & Oliver (2007), Magno (2010), Su & Duo (2012), Wang & Lee (2010), Wong (2005), and Yilmaz (2010).

Meta-cognitive strategies, such as identifying the own preferences and learning needs, task planning, collecting and organizing materials, arranging the learning space and schedule, managing errors, evaluating completed tasks and assessing success are used to manage the learning process in general, which make respondents to recognize them as something they regularly do, i.e. as a habit, instead as specific learning strategies. As opposed to these results, Purpura (1997) found meta-cognitive strategies to have a significant, positive, direct effect on the use of cognitive strategies, providing clear evidence that meta-cognitive strategy has an executive function in terms of using cognitive strategy in the completion of assignments.

Results of this study confirm that cognitive strategies have modest effects on the internal locus of control of gifted students, while meta-cognitive strategies have a significant effect on their internal locus of control. These findings are partly consistent with previous research conducted by Cassidy & Eachus (2000), who reported that strategic approach to learning and self-efficacy are negatively correlated with the external academic locus of control and superficial learning. These findings are in line with previous research of Busato et al. (1998), and it can be concluded that being confident in the own abilities is related to strategic approach to learning. As opposed to this, relying on external factors, such as luck, leads to doubts in one's own ability and lower academic success.

Correlation analysis between academic self-efficacy, locus of control, and the use of cognitive language learning strategies revealed similar results in previous studies presented in this paper. It can therefore be concluded that high academic self-efficacy and internal locus of control are in correlation with the use of cognitive or meta-cognitive learning strategies of gifted students.

5. CONCLUSION

Student self-efficacy and internal locus of control are influential independent variables for the success in foreign language learning. Self-efficacy is one of the factors that regulate the behaviour of gifted students, improves academic achievement, and leads to self-regulation. By enhancing meta-cognitive awareness, it is possible to improve the ability of decision making, planning, interacting with others, thinking, self-evaluating, and self-regulating among the gifted students. Training in cognitive and meta-cognitive skills is one of the most important mechanisms for the development of self-efficacy.

In addition, by focusing teaching activity on building proactive attitude in gifted students, which implies taking initiative and higher levels of personal responsibility, we can develop the internal locus of control. Moreover, it is possible to introduce a reward system through which the achievements of gifted students can be controlled, along with self-assessment, parallel to the creation of the students' own development plans in language learning. Internal locus of control seems more desirable and healthier in academic education than the external locus of control, as it gives the impression to students that they can influence the outcome of their learning activities. This learning approach makes gifted students proactive and more achievement-oriented.

Teaching about different ways of thinking is yet another way to improve self-efficacy. Teaching methods based on principles and methods of cognition can contribute to overcoming this task, as cognitive skills play an important role in various cognitive activities. Cognitive strategies have a major impact on the achievement of gifted students, since the use of cognitive and meta-cognitive learning strategies allows for immediate involvement in education, internal control, improved motivation, efficacy and creativity. Moreover, the significant use of cognitive and meta-cognitive strategies supports and develops the confidence of gifted students, allowing them to identify problems, analyze their own activities, and find the best solutions in different learning situations.

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