A REVIEW OF RESEARCH INTO METACOGNITIVE STRATEGIES IN THE PROCESS OF EDUCATION

LUCIA MICHALEKOVÁ

Stupeň, forma, ročník štúdia: PhD., externá, 1.
Študijný program: Anglický jazyk a anglofónne kultúry
Konzultant: Doc. Zuzana Straková PhD.

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Metakognitívne stratégie vo vyučovacom procese – prehľad výskumov v danej oblasti
Abstrakt

Príspevok poskytuje prehľad zahraničných vedeckých štúdií a odborných článkov, ktoré sa zaoberajú výskumom v rámci metakognície a metakognitívnych stratégií používaných najmä pri výučbe cudzieho jazyka počas predchádzajúcich pätnástich rokov. Hlavným cieľom článku je popísať kľúčové oblasti záujmu zahraničného výskumu v oblasti metakonitívnych stratégií ako aj vedecké metódy potrebné na získavanie jednotlivých údajov v rámci skúmanej problematiky. Primárna pozornosť je venovaná najmä metakognitívnym stratégiám vyučovania cudzieho jazyka a ich vzájomnému vzťahu s jednotlivými jazykovými zručnosťami.

1 Introduction

It seems that metacognition plays an important role in a successful process of foreign or second language learning. The aim of this review is to investigate empirical research focused on mutual relation of metacognition or metacognitive strategies and a process of education, especially of foreign/second language learning. The review deals with scientific outcomes of studies which carried out the research of metacognition during the course of last 15 years. The main focus is placed on sphere of scientific investigation within the area. This paper also gives an overview of scientific practices used in the field of metacognitive knowledge and language learning.

2 Metacognition and language learning strategies

According to Klein's Comprehensive Etymological Dictionary of The English Language the word 'meta' is defined as a preposition of a Greek origin with several meanings such as 'after', 'along with', 'behind' or 'beyond'. If the prefix is added to the name of a subject, the meaning of the original subject is designated at a more abstract and higher degree. The word metacognition has been defined in many different ways over last decades. The original definition was created in the late 1970s by John Flawell, a founder of social cognitive developmental psychology, as *"cognition about cognitive phenomena"* or *"thinking about thinking"* (Flawell, 1979, p. 906).

Metacognition plays an important role in the process of learning including variety of processes and activities such as communication, language acquisition, problem solving, reading comprehension, and many others. According to Chamot (2009, p.54) *"metacognition consists of the learners understanding of his or her own knowledge and thinking processes and the learners ability to regulate his or her own learning"*. It is a special type of ability and knowledge which is continually developed via personal experience and education throughout learner's life. Metacognition refers to learner's awareness and understanding of one's process of thinking. Moreover, metacognitive skills are important not only

at school and professional career, but they are used throughout whole learner's life. This is the reason why metacognitive learning strategies play significant role in the process of foreign language learning.

According to Rebecca Oxford (1990, p.135) *"metacognitive strategies allow learners to control their own cognition – that is, to coordinate the learning process by using functions such as centering, arranging, planning, and evaluating"*. Foregoing research indicates that language learning strategies are among the main factors that help determine how and how well students learn foreign language. It also shows that the teaching metacognitive learning strategies in content courses improve student's learning; however, few teachers at tertiary education explicitly teach study strategies. They probably assume that students have already learned most of the strategies at lower levels of education. As Chamot states (2009, p.53) *"good language learners have a range of learning strategies to call on"*. Furthermore, they know *"how to select and implement strategies that are appropriate for the task"*. There is an important role of the teacher even at the tertiary education to explain to the learner the importance of metacognitive learning strategies. Moreover, the teachers should demonstrate them how to use the learning strategies efficiently and encourage their students in their endeavour to become more self-regulated learners.

In the following text it is not necessary to highlight the distinction between second language learning and foreign language learning. While a second language functions as means of communication and plays a social role within the community where it is learned, a foreign language is "*employed mostly to communicate elsewhere*" (Oxford, 1990, p. 6).

3 The focus and the extent of foregoing research on metacognition in foreign language learning

As reported by Raoofi et al., (2014), over the last two decades several research studies have focused on foreign/second language learning strategies (such as Plonsky, 2011; Goh, 2008; Wenden, 1998; Carrell, 1998; Taylor et al., 2006; Chamot, 2005) which have been mostly aimed at general learning strategies. Considering a growing number of studies investigating metacognition in foreign/second language learning, it seems to be necessary to do a continuous review of research into metacognitive learning strategies in the process of foreign/second language education.

To gather a collection of current studies on metacognition in the realm of foreign/second language learning, the electronic databases were employed to collect all possible research studies aimed at investigation of metacognitive language learning strategies. The research was carried out online and only no-charged materials published between 2003 and 2016 were included into investigation. The online research included the combinations of the following key terms: metacognition, metacognitive awareness, learning strategies, second language and foreign language. This initial research provided a total of 40 studies which were further reviewed/analysed in more detail to meet two following criteria selected for this review: 1. what fields of social science are treated by scientific research within the area of metacognition and learning process, 2. if the research covers learning process of foreign language, what language skills are being investigated. Studies not related to foreign/second language learning were excluded in this synthesis.

The scope of the research performed in the field of metacognition ranged from perceived stress and negative emotions affecting language learning, through self-confidence and learning awareness of foreign language learner, to the field of acquiring four language competencies reading, listening, writing and speaking. As there was such a wide range of subject-matter connected with metacognitive learning strategies, the selected articles were sorted into 4 topics – general, reading, listening and writing. The topics do not include speaking because there was only one paper containing oral language proficiency in its title, however, the paper focuses on listening comprehension. The classification of the articles was provided according to the criteria which area or skill of foreign/second language learning they treated. Finally a total of 29 articles from the following professional journals were selected for this review: *Studies in Educational Evaluation, Procedia - Social and Behavioral Sciences, Behaviour Research and Therapy, International Journal of Comparative Literature & Translation Studies, Learning and Individual Differences, TESL-EJ, International Journal of Language Learning and Applied Linguistics World (IJLLALW), International Journal of Linguistics, SAGE Open, The*

Journal of Teaching Language Skills (JTLS), Journal of Language Studies, Theory and Practice in Language Studies, Modern Journal of Language Teaching Methods (MJLTM), International Journal of Research Studies in Language Learning, The Reading Matrix, Journal of Applied Linguistics and Language Research, Springer, International Journal of Educational Investigations, International Journal of English Language and Literature Studies, The CATESOL Journal, Revista Signos Estudios de Lingüística, System, Journal of Language and Linguistic Studies, TESOL Journal.

All the papers were arrayed on the basis of a coding scheme (see Table 1). The narrative type of review was chosen to conduct since the design and methodological feature of the selected studies differed a lot. To perform a systematic review, all papers were described, compared and contrasted in systematic and holistic way.

Table 1. Coding scheme to array the studies

Variables	Values			
Study				
Year of publication				
Number of participants				
Participant's L1/country				
Participant's L2				
Data collection				
Educational Institution	Secondary		University	
Control group	Yes		No	
Learning domain	General	Reading	Listening	Writing

Source: Collaborated by author

3.1 General

This section covers eight papers where metacognition and foreign language learning in general are involved into research. The investigation includes papers published online between 2003 and 2015.

The research area of the papers included varies considerably. While Bernat and Gvozdenko (2005) offer theoretical argumentation for an interdisciplinary approach to beliefs about language learning research, the other authors (see Table 2.) provide particular outcomes of their former investigation. The data were gathered through different form of questionnaires (Koopman, Bakx, Beijaard, 2014; Wells, Cartwright-Hatton, 2003; Hashempour, Ghonsooly, Ghanizadeh, 2015), Roman's and Gallego's "ACRA" test of learning strategies (Muelasa, Navarro, 2014), managing metacognition inventory using PQ4R study method (Kisac, Budak, 2013), self-regulation trait (SRT) designed by O'Neil and Herl in 1998 (Hashempour, Ghonsooly, Ghanizadeh, 2015), and two experiments exploring links between task performance feedback, task-relevant metacognition, and problem-solving performance (Coutinho, Wiemer-Hastings, Skowronski, Britt, 2005).

Table 2. Studies investigating the relation between metacognition and foreign language learning in general

Study	Year of publication	Learning domain
Wells A. Cartwright-Hatton S.	2003	The paper focuses on the development and properties of a shortened 30-item version of the metacognitions questionnaire (MCQ) in which authors suggested a five-factor model.
Bernat E. Gvozdenko I.	2005	The paper argues for an interdisciplinary approach to beliefs about language learning research.
Coutinho S. Wiemer-Hastings K. Skowronski J. J. Britt M. A.	2005	The paper provides the results of two experiments which explored links between task performance feedback, task-relevant metacognition, and problem-solving performance.
Kisac I. Budak Y.	2013	The paper investigates metacognitive skills or strategies of university students according to their perceived self-confidence levels about learning.
Koopman M. Bakx A. Beijaard D.	2014	The paper is focused on relation between learning environment characteristics, student's goal orientation and learning strategies.

Muelasa A. Navarro E.	2014	The paper analyses the correlation between learning strategies used by students and their academic performance in the subjects of language and mathematics in the social sciences.
Zafarmand A. Ghanizadeh A. Akbari O.	2014	The paper examine the relationship between EFL learners' goal orientation, metacognitive awareness and self-efficacy in a single framework.
Hashempour M. Ghonsooly B. Ghanizadeh A.	2015	The paper studies two learner-related psychological factors − metacognitive awareness and self-regulation.

Source: Collaborated by author

With regard to the educational institution and country where the research was carried out, the investigation included two secondary schools (Koopman, Bakx, Beijaard, 2014 – The Netherlands, Muelasa, Navarro, 2014 – Spain), and four universities (Kisac, Budak, 2013 – Turkey, Hashempour, Ghonsooly, Ghanizadeh, 2015 – Iran, Coutinho, Wiemer-Hastings, Skowronski, Britt, 2005–USA, Zafarmand, Ghanizadeh, Akbari, 2014 – Iran). The study of Wells and Cartwright-Hatton (2003, UK and Norway) included student and non-student participants whose mean age was 33.5 years. As already mentioned, Bernat and Gvozdenko (2005, Australia) provided a theoretical synopsis of research focused on the beliefs of foreign and second language learners in various contexts, using a number of different approaches.

3.2 Reading
This part of the review includes nine studies which are generally dealing with the effect or impact of even metacognitive language learning strategies use, or metacognitive awareness on reading achievement of foreign/second language learners. The studies were available online and they were published between 2004 and 2015. The researchers were concerned with many different areas in their investigation so it will be entirely beneficial to note main aims of their research. They applied variety of research methods to verify or support their scientific expectations.

The authors of seven studies provided their carried out their investigation at university environment (Anderson, 2004; Aghaie, Zhang, 2012; Pammu, Amir, Maasum, 2014; Razi, Çubukçu, 2014; Perales Escudero, Reyes Cruz, Méndez, 2014; Khodaverdian, Sheikh, Vahdany, 2015; Rekabdar, Behrouzi, Hakhverdian, 2015) and two studies were conducted at secondary or college environment (Dabarera, Renandya, Jun Zhang, 2014; Wang, 2015). The research of all authors incorporated learners who learned English language as foreign/second language, however, Anderson (2004) investigates the differences between L1 and L2 along with differences ESL and EFL reading strategies. As stated above, the researchers drew their interest to many different areas which are briefly specified in the following table (see Table 3.).

Table 3. The focus of research in the field of metacognition and reading comprehension

Study	Year of publication	The focus of research
Anderson N. J.	2004	The paper studies differences between L1 and L2 reading strategies. It also examines the differences between ESL and EFL reading strategies using participants' metacognitive reading strategies.
Aghaie R. Zhang L. J.	2012	The study investigates the impact of explicit teaching of reading strategies on EFL students' reading performance using a questionnaire adapted from Chamot and O'Malley's (1994) cognitive and metacognitive strategies framework.
Pammu A. Amir Z. Maasum T. N. R. M.	2014	The case study explores metacognitive reading strategies of less proficient learners at tertiary level of education.
Perales Escudero M. D. María del Rosario Reyes Cruz Méndez E. H.	2014	The paper treats a quasi-experimental, mixed-methods study which examines the impact of a linguistic intervention on rhetorical inferential comprehension and metacognition in EFL academic reading.

Razi s. Çubukçu F.	2014	The paper explores a quasi-experimental study investigating the impact of a metacognitive reading strategy training programme (ME-TARESTRAP) on metacognitive reading strategies and reading comprehension.
Dabarera C. Renandy W. A. Jun Zhang L.	2014	The study investigates the impact of metacognitive scaffolding and monitoring on reading comprehension.
Khodaverdian M. Sheikh S. Vahdany F.	2015	The study explores the relationship between self-regulatory development, language learners' metacognitive awareness and L2 reading comprehension of EFL.
Rekabdar S. Behrouzi P. Hakhverdian A.	2015	The paper treats the effect of using metacognitive strategies on reading achievement of intermediate introverted and extroverted learners.
Yen-Hui Wang	2015	The study researching the participants' metacognitive awareness of reading strategies use. The participants were required to read aloud and think aloud the designated texts.

Source: Collaborated by author

3.3 Listening

Nine studies concerned with metacognitive language learning strategies and listening comprehension are explored in this section. The papers were published online between 2012 and 2016.

Main focus of the investigation was put on various scientific procedures used to examine the impact of metacognitive language learning strategy use on the listening performance of students of English as foreign/second language. In general, all reliable data were collected by combination of various forms of questionnaires, metacognitive strategy instructions or training, language proficiency tests, pre-test and post-tests interviews, language learning orientations scale and other quantitative and qualitative research methods mentioned below in more details (see Table 4.).

In fact, the learning domain of all studies was based on investigation the effect of metacognitive strategy instruction on the listening performance of EFL university students (Birjandi, Rahimi, 2012; Selamat, Sidhu, 2012; Bidabadi, Yamat, 2013; Rahimi, Katal, 2013; Harputlu, Ceylan, 2014; Mansoor, Fakhri Alamdari, 2014), EFL students of senior high school (Tsai, 2013.), or students studying English for academic purpose (Rahimirad, Moini, 2015). The control group was not stated in five studies (Bidabadi, Yamat, 2015; Harputlu, Ceylan, 2014; Vahdany, Akbari, Shahrestani, Askari, 2016; Tsai, 2013; Selamat, Sidhu, 2012) and authors of four studies compared their results with control group of participants who did not received any metacognitive strategy training instruction instruction (Birjandi, Rahimi, 2012; Mansoor, Fakhri Alamdari, 2014; Rahimi, Katal, 2013; Rahimirad, Moini, 2015).

Table 4. The ways of data gathering for metacognitive language learning strategy instruction research on the listening performance

Study	Year of publication	Way of data collection
Birjandi P. Rahimi A. H.	2012	The combination of TOEFL listening section test, a series of oral texts about a variety of topics and had various lengths, and the strategy training following the models proposed by Vandergrift and Tafaghodtari (2010) and O'Malley and Chamot (1990).
Selamat S. Sidhu G. K.	2012	The combination of TOEFL listening section pre and post-tests, a questionnaire, 10-week strategy training, and semi-structured interviews with the subjects. The questionnaire was adapted from Vandergrift et al. (2006) Metacognitive Awareness Listening Questionnaire (MALQ). Metacognitive Strategy Training Instruction (MetSI) based on Brown's Metacognitive Strategies.
Bidabadi F. S. Yamat H.	2013	The combination of Oxford Placement Test (OPT) developed by Oxford University Press (Allan, 1992), a questionnaire and semi-structured interviews. The Meta-cognitive Awareness Listening Questionnaire (MALQ) was adapted from Vandergrift et al., (2006).

Rahimi M., Katal M.	2013	The combination of TOEFL language proficiency test (listening and speaking sections) and Metacognitive Awareness Listening Questionnaire (MALQ) adapted from Vandergrift et al. (2006).
Tsai Ch. Ch.	2013	The combination of Chinese version of Foreign Language Listening Anxiety Scale (FLLAS) and Listening Comprehension Strategy Inventory (LCSI).
Harputlu L., Ceylan E.	2014	The combination of Metacognitive Awareness Listening Questionnaire (MALQ), Language Learning Orientations Scale (LLOS) and the listening section of the TOEFL. The Metacognitive Awareness Listening Question-naire consisted of 21 items and was developed by Vandergrift, Goh, Mareschal, Tafaghodtari (2006).
Mansoor F., Fakhri Alamdari E.	2014	The combination of a language proficiency test, a listening comprehension test, and a ten-week intervention program that involved even the linear in-struction of ten metacognitive strategies, or a ten-week metacognitive peda-gogical sequence.
Rahimirad M., Moini M.R.	2015	The combination of academic listening sections of the British International English Language Testing System (IELTS), 16 hours of metacognitive strate-gy instruction based on the models proposed by Vandergrift, and pre-test and post-test interviews.
Vahdany F. Akbari E. Shahrestani F. Askari A.	2016	The combination of TOEFL paper-based test, IELTS Listening Comprehen-sion Test, Cognitive and Meta-cognitive Strategy Questionnaire-adapted from Vandergrift (2003), and immediate retrospective interviews conducted in L1.

Source: Collaborated by author

3.4 Writing

The last section of the review includes only three studies which were published online between 2014 and 2015. The main focus of the research is placed on different targets linked with either as-sessing metacognitive awareness questionnaire of EFL learners (Farahian, 2015), studying the effects of monitoring and planning skills as metacognitive strategies on writing accuracy of EFL learners (Panahandeh, Esfandiari Asl, 2014), or understanding of metacognitive knowledge use of EFL learn-ers' to promote learners' self-regulation in the process of writing skills learning (Lam, 2015).

Writing is one of the most sophisticated and problematic area in foreign language learning because it incorporates complex accomplishment of the language system and linguistic skills such as syntax, spelling, and writing conventions. Moreover, writing is a highly time consuming activity and most EFL learners rarely have writing courses in English.

In their study, Panahandeha and Esfandiary Asl (2014) examined the effects of two metacognitive learning strategies (planning and monitoring) on EFL learners' argumentative writing accuracy. Their study incorporated various instruments such as Michigan Test of Language Proficiency (MTELP) writing tests, pre-test, post-test, and course materials which functioned as the source book of their study. Sixty students participated in the research and they were divided into an experimental group and a control group. The experimental group participants took part in eight-week writing instruction based on metacognitive strategies, whereas the control group received only routine writing instruc-tion. Both groups were post tested and all the data were carefully analysed. The results of the investi-gation showed a positive effect in the experimental group's writing performance.

The author of the second study (Farahian, 2015), included into the review, attempted to construct and validate a metacognitive awareness writing questionnaire (MAWQ). The investigation included an interview with 59 EFL learners with different level of language proficiency and they also took a writing assignment. All interviews were tape-recorded and transcribed and on the basis of the content analysis of responses, a list of statements was developed. Finally the main version of questionnaire was prepared.

The study of Lam (2015) deals with understanding how explicit instruction shapes the metacogni-tive knowledge use of EFL learners and whether this knowledge promotes self-regulation in learning of writing. Four candidates were chosen on the basis of IELTS test to participate in the investigation. They experienced a 15-week writing course which was developed from Flavell's (1979) and Victori's (1999) seminal work. The course emphasised "*the significance of cognitive monitoring (i.e. metacog-*

nitive knowledge and experience) in facilitating learners' language development in the composing process" (Lam, 2015, p. 532). The author of the study used four research methods including stimulated recalls, individual interviews, language learning histories, and text analysis. The data were further analysed and the results of the research indicate that *explicit strategy instruction in writing was likely to make students more self-regulated, strategic, and resourceful in coping with diverse writing tasks, although not all four writers enjoyed the same level of success throughout the course* (Lam, 2015, p. 527).

4 Conclusions

Metacognition and metacognitive learning strategies seem to contribute significantly to success in foreign/second language learning. According to scientific results of studies included into this review, several conclusions concerning the importance of metacognition in the realm of foreign/second language learning can be drawn. Wide range of fields in social science is treated by scientific research within the area of metacognition and learning process. It covers the issues ranging from relation between learning environment characteristics, student's goal orientation and learning strategies (Koopman, Bakx, Beijaard, 2014), through relationship between learner-related psychological factors such as metacognitive awareness and self-regulation (Hashempour, Ghonsooly, Ghanizadeh, 2015), to particular topics related to a specific language skill development such as reading, listening, and writing.

According to the fact that there are probably few studies, if any, where speaking skill in relation to metacognition is treated, it will be convenient to focus the future research into this area. All the researchers used a combination of various scientific tools to investigate their subject matter and a combination of questionnaire, foreign language tests and interview is the most used measure for metacognitive strategies.

Considering positive outcomes of all studies, it is possible to state that pedagogical intervention can develop learners' metacognition. It is obvious that teachers should understand the importance of role which metacognition plays in language learning process because it helps learners to become more autonomous and self-regulated language learners. Moreover, teachers should focus on both teaching language content and teaching the ways and processes of learning in order to increase their students' metacognitive knowledge.

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