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The effect of cognitive and meta-cognitive strategy instruction on academic performance

Abstract. *The purpose of the article is to explore the effect of cognitive and metacognitive language learning strategies on learners' academic performance, strategic thinking, and self-regulated learning to tackle a major problem regarding Kazakhstani students' low level of functional competence and literacy according to PISA-2018 results. To address the issue, the article considers a wide array of classifications of higher order cognitive and metacognitive strategies presented by researchers, different ranges and types of learners' actual strategies use, models of cognition and metacognition as well as positive and negative research findings focused on single and multiple strategy trainings. Multiple sets of explicit strategy instructions are needed for learners to comprehend and perform the task successfully, achieve a learning goal, monitor selected cognitive strategies, regulate the whole cognitive learning process when doing the task and transfer prior knowledge to new learning and life situations. The article also presents many issues raised in teachers' strategy instructions. As a solution, directions for further research are given to integrate all three cognitive, metacognitive, and social-affective strategies into classroom settings as the power of social interaction, cooperation, motivation, and self-efficacy believes is crucial to improve learners' academic proficiency and functional competence.*

Keywords: *cognitive, metacognitive strategies, strategy instruction, single and multiple strategies, reading comprehension, model of strategy instruction.*

DOI: <https://doi.org/10.32523/2616-6895-2021-134-1-126-139>

Received: 20.10.20 / Accepted: 2.12.20

Thanks, God, for living and learning throughout life

Introduction

According to the international PISA-2018 (the Program for International Student Assessment), focused on assessing functional literacy, scholastic performance on reading, math and science, Kazakhstani 15-year-old students ranked 69th place out of 77 countries in reading worldwide. 36% of students obtained Level 2 proficiency in reading compared to the Organization for Economic Cooperation and Development (OECD) average of 77%. In fact, PISA-2009, 2012 and 2015 results indicate that Kazakhstani

students' problems deal with regulating their reading process strategically: interpreting problems in formulated tasks, comprehending written information represented in graphs and tables and generalizing text information [1]. Consequently, key questions of how to teach students to transfer their acquired knowledge to new learning and life situations, how to develop students' functional literacy arise closely interconnected with students' responsibility, academic performance, motivation; self-efficacy believes and self-regulated learning. As a solution to the problems, the OECD Learning

Compass 2030 offers cognitive, metacognitive, social, and emotional skills as skills for 2030 needed for students to meet educational and societal demands of modernized education [2, p.86]. Accordingly, low level of Kazakhstani students' functional competence is the main reason for preparing pre- and in-service teachers for cognitive and metacognitive strategy instructions, introducing them into curriculum, qualification courses, pre-school, school, and higher education system. The purpose of the given article is to explore whether combined cognitive and metacognitive strategy trainings affect EFL students' abilities to think strategically as well as improve their academic performance in reading. The article uncovers numerous classifications of cognitive and metacognitive strategies proposed by different researchers, examines students' ranges and types of actual strategies use, presents efficient models of cognition and metacognition, raises complex issues in strategy instructions and offers possible implications for further research. This article may serve as a basis for teachers to integrate strategy instructions into Kazakhstani classroom settings to help learners manage their cognitive learning process reasonably as well as enhance their academic performance.

Methodology

Classification of cognitive strategies. As the origin of cognition refers to the field of psychology with much focus of thinking about human's mental cognitive process of organizing and storing of new information in memory, different definitions and classifications based on theoretical and practical research arise on cognitive and metacognitive strategies among researchers who approach this complex aspect from different perspectives over the last decades [3].

The term 'cognitive strategy' is described as a person's cognitive behavior, individual operations and internal mental procedures with specific steps through which a learner undergoes consciously to achieve a cognitive learning goal [4, p.68] associated with problem solution, preparation for a test, text

comprehension or a learning task performance. Cognitive strategies entail interaction and direct handling with incoming information mentally (visualizing) or physically (using graphical organizers) implementing a specific individual strategy or multiple sets of strategies aimed at comprehending, problem solving and completing a particular task successfully [5, p.5; 6, p.138]. Therefore, a learner should be taught an extensive set of strategies; their names, definitions with demonstrative situational examples, how, when, where and why to use them, in individual or multiple complex ways because, the real outcome depends on how a learner matches the strategies to the task requirements in an exact and flexible way. For instance, if an expository text requires organizing text structures such as sequence, description, problem and solution, comparison and contrast, learners can use note taking, or graphic organizer strategy as a single strategy to visually represent content, concepts, and interrelationships between them. In order to comprehend the meaning of a narrative text and control his cognitive process a learner may choose multiple cognitive and metacognitive strategies in combination: activating prior knowledge, identifying purpose for reading, predicting and previewing strategies can be used before reading while rereading, making inference or reading between lines, self-questioning, adjusting reading speed, self-monitoring, visualizing, summarizing paragraphs of the text can be employed during reading, whereas summarizing the whole text, paraphrasing the main idea, clarifying questions may be utilized after reading. Another characteristic feature of cognitive strategies suggested by Oxford is that cognitive strategies are the most essential language learning strategies with the help of which learners manipulate and transform the target language through identification, retention, and retrieval of information [7]. Classification of cognitive strategies is presented in Table1.

All in all, although cognitive strategies are saturated with multitude of types, they have the same purpose: to facilitate the learning process through complex cognitive procedures for successful accomplishment of specific learning

Table1

The classification scheme of basic cognitive strategies	
Cognitive strategies according to listening and reading comprehension proposed by O'malley et al.	rehearsal, organization, inference, summarizing, deduction, transfer, elaboration, repetition, resourcing, grouping, note-taking, deduction/induction, substitution, subcategories of elaboration strategy: personal, world, academic, between parts, questioning, self-questioning and creative imagery.
Four sets of cognitive strategies suggested by Oxford	1) <i>practicing strategies</i> : repeating, formally practicing with sounds and writing systems, recognizing and using formulas and patterns, recombining and practicing naturalistically; 2) <i>receiving and sending messages</i> : getting idea quickly through skimming, scanning, previewing questions and implementing resources to decode and encode messages; 3) <i>analyzing and reasoning strategies</i> : deductive reasoning, analyzing expressions, contrastive analyzing to identify comparison and contrast, similarities and differences, translating and transferring; 4) <i>building structures for input and output</i> : taking notes, summarizing and highlighting.
Task-focused cognitive strategies presented by Pressley and Woloshyn [8]:	1) <i>general strategies</i> used by learners to analyze and solve problems; 2) <i>study strategies</i> : recalling information or a time line in a test study; 3) <i>writing strategies</i> : planning, drafting, reviewing and revising an essay; 4) <i>reading strategies</i> : predicting, summarizing, activating prior knowledge, self-questioning, rereading text paragraphs.
Differentiation of cognitive strategies into three groupings by Phakiti [9]	1) <i>comprehending strategies</i> : translating, focusing on meaning, identifying main points, skimming and scanning; 2) <i>retrieval strategies</i> : using grammar, prior knowledge, multiple strategies and relevant information; 3) <i>memory strategies</i> : comprehending questions before task completion, repetition, recalling information and tasks through allocating time.

tasks. However, it is not possible to become a good strategic learner without synergetic interaction of cognitive strategies with metacognitive ones leading to a self-regulated autonomous learning if used in a regular and flexible way.

Classification of metacognitive strategies.

How to elaborate an exact framework of metacognitive strategies is one of the complicated issues for many researchers as there is a wide range of classifications that differ from one another in terms, concepts, structures, and confusing questions still arise regarding their functions in self-knowledge acquisition and relationships with human consciousness [10].

Metacognitive strategies refer to learner's general higher order thinking about his own cognitive process managed, directed, regulated, and guided by him consciously [11] not only while doing the task in coordinated use with cognitive strategies but also before and after the task performance. However, if cognitive and metacognitive strategies are practiced systematically, they can be successfully employed automatically without learner's conscious control. The structure of basic metacognitive strategies encompasses *planning* which mostly occurs before doing a task after a learner becomes familiar with task requirements, *monitoring* during the cognitive task execution

and *evaluating strategy* coming after the task has been accomplished.

Planning strategies refer to procedures before reading and involve selecting goals, predicting, selective attention, choosing a set of strategies according to task demands, distributing time and resources [12]. According to O'Malley et al., it can be categorized into such components as *advance organizers* (previewing the main idea and concepts through skimming), *directed attention* (focus on the task in general without attention to concepts, ideas, principles and situational details in the text), *selective attention* (paying attention to phrases, concepts, specific details in advance and scanning them for an efficient task performance), *self-management* (accountability for one's cognitive process, directing and controlling one's learning procedure).

A good example of *monitoring strategy* is learner's regular self-testing his performance while doing the task [13]; his awareness of how the learning process is going on, what strategies are being employed, whether he understands the text meaning and questions, what another cognitive or metacognitive strategy to deploy to repair comprehension or stop using the previous strategy and change it into more effective one in case the content and context of the task is unclear. To monitor one's information processing and comprehension, to check and revise task elements regularly are the main functions of self-monitoring metacognitive strategy which according to O'Malley et al., is divided into such subcomponents as production, auditory, visual, style, strategy, plan and double-check monitoring. Wenden highlights the importance of monitoring process for a learner to generate metacognitive knowledge, the term, described by Flavell as a person's knowledge about how to manage one's cognitive process and achieve the goal in combined interactions with one's person, task and strategy variables which can be activated by the person consciously or unconsciously when accomplishing a cognitive task [14]. As an example, Wenden illustrates that a learner gives himself internal feedback perceiving in what part of the task he has a difficulty, what decision to make to overcome this challenge. These tactics

serve as a good basis for his problem solving and internal assessment of comprehension which is a powerful indicator to improve and expand his cognition, metacognition, and motivation.

According to Schraw and Moshman, *evaluating strategy* relates to learner's accurate assessment of both his final task product and self-regulatory process as well as checking the outcomes, strategies use and the level of language learning skills against measures of accuracy. O'Malley et al., subdivide self-evaluation strategies into production, performance, ability, and strategy evaluations which are of great significance to deliberately assess one's strengths and weaknesses within these aspects.

A classification of metacognitive reading strategies is associated with metacognitive awareness of reading strategy inventory (MARSI) elaborated by Mokhtari et al., to assess students perceived metacognitive awareness. This self-report research instrument consists of three metacognitive strategies. *Global reading strategies* include employing typographical aids, analyzing, and evaluating and previewing the text, whereas *problem solving strategies* involve re-reading, guessing the meaning of unknown words, thinking about what a learner is reading, changing the reading pace. *Support reading strategies* encompass reading aloud, discussing about the learned material with a partner to check one's understanding and underlining main ideas [15].

Overall, metacognitive strategies as higher-order thinking strategies orchestrate the whole cognitive process and serve as a great tool for a learner to manage and self-regulate his mental routine, reinforce his schematic self-knowledge when applied regularly.

Identification and classification of students' current strategy use

Earlier descriptive studies conducted on determining learners' actual cognitive and metacognitive strategies used by them when doing various types of tasks laid a foundation on elaborating a deep classification scheme with its definitions, the range, and types of strategies, identifying differences in strategy use between different levels of students. One example is four

sequential longitudinal and descriptive studies carried out by O'Malley et al., with beginner, intermediate and advanced levels of EFL and ESL students implementing retrospective interviews, classroom observations and think aloud method. Overall, strategies utilized by learners on language learning tasks such as vocabulary, pronunciation, grammar, oral drills, listening and reading comprehension, writing compositions and oral presentations, differed when comparing learners' language proficiency levels, the range and number of students' strategies application, differences between effective and less effective learners in their strategy use frequency. For example, in study 1 ESL beginners' cognitive strategies use whose interviews were taken in native language doubled in number in comparison with intermediates. On the contrary to the previous study, in study 2 EFL Spanish and Russian intermediate and advanced students used more strategies than beginners. In study 1 planning was the most frequently used dominant metacognitive strategy, and repetition, note taking, imagery and translation were used as frequent cognitive strategies. What is surprising in study 1 is that learners did not utilize multiple strategies for integrative tasks which require active mental process, instead, a wide range of strategies were employed for isolated tasks. In study 2, planning metacognitive strategies predominated in both Spanish and Russian students which are like study 1. All levels of Spanish students preferred translation cognitive strategy more frequently, whereas beginner Russian students tended to use more repetition and translation, advanced and intermediate ones reported to use note taking. Beginners of both groups preferred repetition, translation, and transfer while other levels employed inference, repetition and transfer and used a little elaboration, grouping, summarizing, and rehearsal. In study 3, world knowledge, personal experience and self-questioning types of elaboration strategy were employed by effective learners efficiently rather than less effective learners. In study 4, a new metacognitive strategy known as 'problem identification' was revealed, a close relationship of elaboration cognitive strategy with transfer, imagery and

inference was established. Differences between less and more effective learners were that the former utilized fewer strategies than the latter, but they were quite aware of their strategies use which is a crucial point to assist them through strategy training. More effective learners matched sequences of strategies to task demands successfully, activated their prior knowledge, and regulated their comprehension purposefully, deduced meanings from the context, focused on larger chunks and utilized both top-down and bottom-up approach known together as interactive approach. However, less effective learners were not skilled enough at selecting the right strategy according to the task requirements, limited with fewer strategy types and employed bottom-up approach concentrating on a word-for-word level.

In sum, strategies use varies in students' social and cultural background, levels of language proficiency. A wide repertoire of strategies was determined and sorted; however, a key issue is to what extent cognitive and metacognitive strategies use is effective to improve students' language learning performance or whether they should be taught explicitly to students to become strategic learners.

Cognitive and metacognitive strategy instructions in combination

Why to teach strategies to EFL and ESL learners?

The first reason for teaching strategies lies in their characteristic feature of transferability from one language learning situation to another, from regular task performances to multiple-choice, standardized academic IELTS or TOEFL tests on condition that they are practiced in classroom settings regularly within various contexts and become habitual for learners [16]. For instance, a learner with much and repeated practice can transfer his reading comprehension strategies like skimming and scanning or mind or concept mapping from English subject to History or Biology or he can transmit his metacognitive skills from classroom settings to everyday life situations. The second reason for strategy training is linked to its facilitative, problem solving and goal-directed nature if applied reasonably. As an example, if a task and its requirement is a

problem for a learner, his flexible guidance of selected set of strategies at the right place and the right time is a problem solution. And the third reason for strategy instruction is that it is a main tool to foster autonomous self-regulated learning, which is described by Schraw as learners' abilities to set goals, plan, monitor and evaluate a wide range of cognitive, metacognitive and motivational skills in integration with self-efficacy and epistemological beliefs [17]. Finally, graduate, and undergraduate students' metacognitive awareness positively correlates with their Great Point Average (GPA) academic achievements which validate the necessity of metacognitive instruction [18].

Teaching strategy models: a gradual release of responsibility model and model of metacognition

When teaching a strategy, it is useful to follow 'a gradual release of responsibility' model in which first, teacher-centered instruction predominates and then gradually turns into student-centered one. Five stages of the model include: 1) a strategy should be described explicitly and explained in terms of a strategy name, its definition, when and how it is implemented with a situational example; 2) a strategy should be modeled and demonstrated by the teacher actively with a task example; 3) it should be applied in collaboration of the teacher with learners according to that task; 4) a strategy should be acted by learners under the teacher's guided practice in which his responsibility is diminished moderately; 5) a strategy should be applied by learners independently [19; 20]. Giving learners feedback

Table 2

Model of metacognition suggested by Anderson.

Components	Strategic actions
1. To prepare and plan strategy use.	A learner gets acquainted with the task requirement, sets a goal and reflects about how to meet a learning goal related to the task.
2. To choose and apply specific strategies for a particular task consciously.	This component demands learners' experience in acquisition of a wide range of cognitive strategies in advance, ability to select appropriate strategy matching to the task requirement in different contexts. For example, if a learner faces unknown vocabulary in a text with prefix such as 'misinterpret' he knows that 'a word analysis strategy' is appropriate to choose not deducing meaning from the context. Here, teacher's role is vital to instruct a considerable number of strategies with explanations, demonstrations, much guided and repeated practice. The questions of when and how to use strategies, which of the chosen strategies for a problematic task is better to select are crucial for teacher to explicitly teach first and then to discuss with learners.
3. To monitor strategy use.	Learners stop from time to time and question themselves about how the process is going on, whether they employ those selected strategies and whether they work well, if one does not work what strategy to substitute.
4. To orchestrate multiple strategies.	It depends on teacher's competence and mastery to teach learners how to utilize a set of cognitive strategies corresponding to the task in parallel with metacognitive strategies. For example, a learner may select a word analysis strategy for the word 'antimony' thinking that it is a prefix, but then he substitutes that strategy with deducing meaning from the context since the first strategy does not work.
5. To evaluate strategy application and learning	The concluding stage is important for a learner to self-assess whether the task has been executed effectively, what a learner should do to reinforce his learning process.

on the part of peers and a teacher as well as learners' self-evaluation and self-reflection done after the task accomplishment is the final crucial point to consider. The research findings show that teachers demand from students a quick independent strategy employment without more collaboration, much scaffolding of especially poor learners. So, from authors' perspectives, teachers' frequent guided practice coaching makes sense.

The model of metacognition suggested by Anderson enables learners to regulate their multiple cognitive strategies [21]. Consequently, it is worth to integrate metacognitive instruction into cognitive strategy training under the guidance of the instructor. The five components of the model are illustrated in Table 2.

Results

The effect of cognitive and metacognitive strategy instruction on reading comprehension. Reading comprehension is an active receptive and purposeful process attributing to a close interaction of a reader with the text intentionally through which meaning is constructed [22]. It is also a dynamic complex cognitive process involving construction of mental and memory representations of meaning of the text retained in memory which is further applied to communication with people [23]. Bouchard argues that reading comprehension strategies are needed to be taught specially to English language learners (ELL) because curriculum requires from them to construct not only academic but also subject content knowledge mainly consisted of expository texts with contents, concepts, technical vocabulary and text structures often difficult to understand particularly for less proficient learners. In addition, struggling EFL learners suffer from cultural diversity in linguistic background and insufficient prior knowledge and often approach the text in a word-for-word or sentence-by-sentence context. Kline claims that, most learners read but do not remember what they read, how to connect their prior knowledge to the new text context and meaning because of automatic decoding of word-sentence relationships. The solution to this problem lies

in conducting specific instructions to develop learners' reading skills consciously by interacting both decoding and comprehension components of reading process [24].

Teaching single strategies

Dole's review on research articles demonstrates that employing single strategy instructions such as story map, text structure, imagery, self-questioning and summarizing influenced learners' academic performance favorably when conducted separately as higher order cognitive strategies.

Malekzadeh and Bayat's quasi-experimental design based on one month mind mapping strategy training in integration with constructivist theory model affected Iranian intermediate level students' reading comprehension performance positively. Experimental group outperformed control group in post-test results. Mind mapping strategy training proved its effectiveness and contributed to students' generating new schemata with the help of interconnecting their prior knowledge with new information, getting the main idea from reading topics, using question generating strategy which was crucial for students to discuss in debates when presenting mind map models to groups [25].

Khansir and Dashti examined to what extent question generation strategy trained over ten weeks affect Iranian third grade high school students' reading comprehension achievement as a single strategy. Post test results revealed that both male and female students of experimental groups outgained scores on reading comprehension multiple choice tests in comparison with control groups. And yet, females turned out to be more proficient than males [26]. Another study of single paraphrasing strategy instruction focused on RAP strategy (read, ask yourself and paraphrase the main idea and two details) in integration with self-regulated strategy development (SRSD) model was effective for intermediate struggling learners to recall and retell the text for main idea and detail and answer the questions correctly [27].

The effectiveness of learners' academic performance basically depends on high-quality and higher order strategy training. Three studies

were conducted by Leopold and Leutner with 47 participants of two experimental (experimental-cognitive and experimental –cognitive-metacognitive) and one control group in grade 10 including highlighting (study1), mapping (study2) and visualizing (study3) strategies to address the research question of whether explicit mixed cognitive and metacognitive strategy instructions affect the quality of learners' strategy use positively and correlate with reading comprehension achievement. The following sequence of stages was utilized in all three studies with their own strategy application:

- 1) All groups were exposed to pre-test on scientific text to measure their background knowledge.

- 2) Three experimental-cognitive groups got their cognitive strategy trainings based on the situation. For example, a boy called Daniel had a problem with finding the main idea while reading a biology text. As a solution to the problem, highlighting strategy and its goal was explained, modeled by the teacher: reading the text, circling the main idea, rereading, and highlighting the main details in the text. Experimental-cognitive-metacognitive groups received both cognitive as well as metacognitive trainings. As for metacognitive self-regulation, Daniel questioned, monitored, and evaluated himself about his text performance. Control groups read, discussed the texts, and did grammar tasks.

- 3) Two experimental groups took a test on their instructed strategy knowledge acquisition.

- 4) Scientific texts were distributed to groups to study properly first and then samples were handed in to trace analysis.

- 5) Strategy application questionnaire and verbal ability test were conducted.

- 6) Post-tests focused on scientific texts were carried out in all three groups.

Results of strategy knowledge tests of all three studies indicate that experimental-cognitive-metacognitive groups became more knowledgeable because they received strategy knowledge and self-regulation knowledge rather than experimental-cognitive groups that limited with only strategy knowledge. As for descriptive analysis of highlighting strategy training result

(study1), experimental-cognitive-metacognitive group dominated experimental-cognitive group on reading comprehension post test which confirms the effectiveness of combined strategy training. However, from authors perspectives, the finding that experimental-cognitive group did not outperform control group demonstrate highlighting strategy as unproductive to measure its quality. The authors attribute low potential of highlighting strategy to the finding that learners could identify the main idea and concepts of the text, but they could not bring them into coherent relationships to analyze the text content. In study 2, experimental-cognitive-metacognitive group was better than experimental-cognitive group and control group on text comprehension post test while there was no discrepancy between experimental-cognitive group and control group which confirms less effectiveness of training only mapping strategy without metacognitive self-regulation strategies. Statistic results of study

3 demonstrate that there was no significant difference between experimental-cognitive-metacognitive and experimental-cognitive groups on visualizing post test, however both groups outperformed control group. Consequently, visualizing-cognitive-metacognitive training was not effective when compared with highlighting and mind mapping trainings. In sum, students

benefit from cognitive strategy trainings to comprehend the text reasonably whereas the effectiveness of metacognitive strategy training depend on the cognitive strategies use the potential of which should be supported with mental model construction. Both quantity and quality of strategy instructions make sense to investigate. Cognitive-metacognitive strategy training affects positively on text comprehension rather than cognitive strategy training itself [28].

As a matter of fact, a single higher order cognitive strategy instruction is quite beneficial for beginners, risky and young learners at the outset of strategy learning to introduce it explicitly and practice with gradual increase without confusion of three to five strategy modeling at one lesson, however even when practicing a single strategy, for example, summarizing, a learner may refer to highlighting, note taking and rereading while

seeking main and supporting details in the text. Hence, when teaching a single strategy, it is better to coordinate it with corresponding strategies as well over several lessons. This finding is consistent with Malekzadeh and Bayat's research that coordinated mind mapping with activating prior knowledge, question generating strategies though a study focuses on a single strategy investigation.

Teaching multiple strategies

After detailed analysis of 203 research studies on text comprehension, National Reading Panel (NRP) suggested multiple strategy instruction as the most effective one to help learners to combine sequences of 4-6 strategies during text analysis. Other promising individual strategy instructions include comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure, question answering, question generation and summarization [29]. Multiple strategies can be taught with a set of cognitive (concept-oriented reading instruction (CORI), reciprocal teaching) or metacognitive (cognitive academic language learning approach (CALLA)) strategies or integration of cognitive, metacognitive, and social-affective strategies. For example, a twelve-week empirical study based on explicit metacognitive strategy training using CALLA gave a positive effect on Iranian undergraduate EFL students on reading comprehension and self-efficacy. The rigorous analysis of measurement instruments comprising pre and posttests of Survey of Reading Strategies (SORS) to measure university students' metacognitive knowledge, Motivated Strategies for Learning Questionnaire (MSLQ) to assess self-efficacy, semi-structured interviews, background questionnaire and reading comprehension text showed that the experimental group outperformed the control group on both variables. The findings of the study are crucial to measure self efficacy to motivate students to believe about their capabilities in efficient task accomplishments [30].

Eight-week study based on CALLA strategy instruction and action research design improved reading comprehension and metacognitive strategy application of Turkish university students studying French. Wilcoxon Signed Rank Test

data analysis revealed that 17 out of 18 students got high scores on post reading comprehension achievement test. Pre and post-test descriptive statistical value of Reading Strategy Scale questionnaire showed that students' reading strategies use increased after CALLA instruction, strategies such as self-questioning, selective attention, confirming predictions increased while predicting, using references, note taking decreased. Pre and post think aloud technique data results indicated increase in using strategy types after the training in which cognitive strategies dominated metacognitive ones. Further, students' cognitive and metacognitive strategies employment differed in strategy types: before instruction students relied on strategies related to linguistic and vocabulary structure, whereas after the instruction they concentrated on the organization of text structure, previewing, relating background knowledge, titles, and sections of the text which multiplied their higher order comprehension strategy repertoire [31].

However, strategy instruction does not always have positive effect on academic performance. For example, an eight-week quasi-experimental research based on CALLA metacognitive strategy training was not effective to measure lower-intermediate Chinese college students' metacognitive awareness and reading comprehension performance due to the short strategy trainings and students' less motivation. The author highlights the importance of combining cognitive, metacognitive, and social-affective strategies to avoid such negative result [32]. Similarly, t-test results of research with beginner level Saudi EFL male college students revealed that there was no correlation between students' current metacognitive strategies use and reading comprehension; there was no relationship between readers' motivation and reading academic achievement but there was positive correlation between learners' metacognitive strategies use and reading motivation. The author emphasizes that learners' metacognitive awareness, good strategies use, and high motivation do not guarantee enhanced reading comprehension performance if they do not acquire background and linguistic knowledge duly [33].

Discussion

Issues raised in strategy instructions and possible implications for further research. A considerable number of issues emerge when teaching strategies associated with such problems as curriculum and text requirements, a shortage of time for strategy instruction, high risk tests and some learners' irresponsibility for learning, large class size, less administrative support, teachers' lack of knowledge about language learning strategy instructions [34]. How to integrate cognitive, metacognitive, and social-affective strategies into classroom instructional activities remains one of the challenging questions because three types of strategies should be integrated in such a way that could enhance learners' academic performance, motivation and self efficacy believes. Teachers combine L1 and L2 or use L2 to provide models explicitly but there is less evidence which of them is the most useful. Strategy intervention studies should require not only pre and post test analysis on measuring relationships between experimental and control group learners' metacognitive and cognitive strategy use but also there is a need for assessing their motivation, self-efficacy, text comprehension performance to identify whether there is a significance difference between them [35].

Oxford points out issues concerned with negative effect of strategy instructions on students' academic achievements: 1) insufficient time allocation for strategy training by teachers; 2) assignment tasks are either easy or difficult; 3) strategy trainings are not incorporated into classroom settings regularly; 4) teachers' lack of knowledge about measurement of students' current strategy use before training; 5) two key factors are omitted by teachers: to take learners' learning styles into consideration when choosing tasks to motivate them on the one hand, on the other hand, teaching them to employ unfamiliar but effective strategies [36]. O'Malley et al. argue that learner characteristics including age, sex, learners' positions and prior educational and cultural background cannot be overemphasized alongside with motivation

which is valuable to establish positive attitude toward the strategic learning process, otherwise instructional research may end in a failure.

Review on research articles on EFL and ESL students' strategy use revealed that students were not provided with multiple set of challenging strategies which could satisfy their needs, and mostly they practiced one and the same strategies throughout the lessons. The raised question is why teachers picked up these sets of strategies without identifying students' learning barriers and needs [37]. Therefore, Oxford suggests that it is crucial for teachers to identify learners' current strategies use, learning barriers and needs before strategy instruction. Likewise, it is of great importance to consider learners' preferences and choices and include activities aligned with their actual strategies use, learning styles, cultural and task preferences. Introducing new higher order cognitive strategies fitting to task demands should be taken into consideration to expand strategy repertoire.

Conclusion

If cognitive and metacognitive strategies are taught in conjunction with social-affective strategies, there will be more opportunity for learners to enhance their academic performance, develop functional competences and become independent strategic learners. However, despite effective strategy instructions it is unlikely to achieve learning outcomes with the help of strategies use only, as many factors affect a high level of academic performance such as curriculum course requirements, learner and task characteristics and preferences, students' different levels of language proficiency, learners' different motivations and believes, social and cultural background and teachers' experience and competence. Despite the numerous factors contradicting learners' academic achievements, language learning strategies should be trained to foster their self-regulated learning as the essence of self-regulated learning resides in its driving force to develop competitive, autonomous life-long learners which is one of the requirements of 21st century modernized education.

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Танымдық және метатанымдық оқытудың оқу үлгеріміне әсері

Аңдатпа. Бұл мақаланың мақсаты – PISA-2018 нәтижелері бойынша қазақстандық оқушылардың функционалдық құзіреттілігі мен сауаттылығының төмен деңгейімен байланысты өзекті мәселенің шешімін іздеуде оқушылардың оқу үлгеріміне, стратегиялық ойлауына және өзін-өзі басқаруына оқы-

тудың танымдық және метатанымдық стратегияларын қолданудың қаншалықты тиімді екендігін зерттеу. Бұл мәселені шешу үшін мақалада зерттеушілер ұсынған жоғары деңгейлі танымдық және метатанымдық стратегиялардың кең топтамалары, оқушылар қолданатын әртүрлі ауқымды стратегиялардың түрлері, таным мен метатанымның заманауи үлгілері, сонымен қатар когнитивті және метакогнитивті стратегиялардың оқу үдерісіне негізделген зерттеу нәтижелері қарастырылған. Мұғалімдер оқушылардың проблемалық тапсырмаларды түсініп, сәтті аяқтап, қойылған мақсатқа жетуі үшін, оқушылардың танымдық және метатанымдық стратегияларын сәтті игеруін көздеп егжей-тегжейлі және жүйелі тренингтер жүргізуі керек. Метакогнитивті стратегиялар таңдалған когнитивті стратегияларды бақылау үшін, тапсырмаларды орындау барысында бүкіл танымдық оқу процесін реттеуде және алынған білімді жаңа оқу мен өмірлік жағдайларға ауыстыруда өте маңызды. Сонымен қатар, мақалада мұғалімдердің стратегияларды оқыту барысында туындаған мәселелері және оларды шешу жолдары көтерілген. Осы мәселелердің негізгі шешімі ретінде когнитивті, метакогнитивті және әлеуметтік-аффективті стратегиялардың оқу процесіне интеграциясы бойынша қосымша зерттеулер жүргізу қажеттілігі айқындалған, өйткені оқушылардың академиялық білімдерін де, функционалды құзіреттілігін де жақсарту үшін әлеуметтік өзара әрекеттестік, ынтымақтастық, ынталандыру мен өзін-өзі реттеудің маңыздылығы аса зор.

Түйін сөздер: танымдық, метатанымдық стратегиялар, оқыту стратегиясы, жеке және бірнеше стратегиялар, оқуды түсіну процесі, стратегияларды оқыту моделі

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Влияние обучения когнитивным и метакогнитивным стратегиям на успеваемость учащихся

Аннотация. Целью данной статьи является изучение влияния когнитивных и метакогнитивных стратегий на успеваемость, стратегического мышления и саморегулируемого обучения учащихся в поисках решения актуальной проблемы, связанной с низким уровнем функциональной компетентности и грамотности казахстанских учащихся по результатам PISA-2018. Для решения этой проблемы в статье рассматривается широкий спектр классификаций когнитивных и метакогнитивных стратегий более высокого порядка, представленных исследователями, различные диапазоны и типы учебных стратегий, используемых учащимися, современные модели познания и метапознания, а также результаты исследований, основанных на обучении когнитивным и метакогнитивным стратегиям. Для того чтобы учащиеся могли понять и успешно выполнить проблемные задания и достичь цели, учителям следует провести подробные и систематические тренинги для успешного овладения когнитивными и метакогнитивными стратегиями учащимися. Метакогнитивные стратегии имеют решающее значение для мониторинга выбранных когнитивных стратегий, регулирования всего процесса когнитивного обучения при выполнении заданий и применения предыдущих знаний в новых учебных и жизненных ситуациях. В статье также представлено большое количество проблемных вопросов в рамках исследования. В качестве решения даны направления для дальнейших исследований по интеграции всех трех когнитивных, метакогнитивных и социально-аффективных стратегий в единый процесс обучения, так как эффективность социального взаимодействия, сотрудничества, мотивации и самоэффективности имеет весомое значение для повышения как академических знаний, так и функциональной компетентности учащихся.

Ключевые слова: когнитивные, метакогнитивные стратегии, стратегия обучения, индивидуальные и комплексные стратегии, понимание прочитанного, модель обучения стратегиям.

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