MENTAL SIMULATION SELF-REFLECTION TASKS
FOR INCREASED LEARNING OF ENGLISH

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Summary

The notions of mental simulation and self-reflection have become established in neuroscience. Numerous line of research suggest that mental simulation and self reflection promote enhanced learning in general, specifically foreign languages. Our study explores and discusses these notions for their deeper understanding. The research encompasses smooth simulation with negative outcome and challenging simulation with positive outcome. The paper demonstrates mental simulation self-reflection tasks in correlation with cognitive skill planning. They are embedded within such specific conditions for inducing exploratory behavior as error-approach instruction, tasks with complex and dynamic decision-making characteristics, specific stimulus information (what, when, where) in life situations and peer feedback. The following methods have been used: theoretical methods (analysis, interpretation and generalization), empirical methods (observation). The author provides an example of mental simulation self-reflection tasks with and without problem-solving case study within conditions for exploratory behavior for the topic "Planning a trip to Canada".

Key words: self-reflection, mental simulation, cognitive skill, exploratory behavior, executive function.

1. Introduction

Considering the orientation of the Ukrainian education system towards entering the world educational space, there is a tendency to upgrade the English language education. Convergence of multiple educational tools is essential for accomplishment of this goal. Within the framework of the self-regulation paradigm, the task is to form a personality with the ability to accomplish effective self-reflection for increased learning of foreign languages. Thus, the relevance of the study arises from the need to induce learning by means of self-reflection. The scope of self reflection or self regulation comprises its different aspects (obstacles in learning *(Natress, 2007)*, trial and error approach in self-reflection *(Shinn, 2023)* and others. Our research paper is limited to mental simulation self-reflection within conditions for exploratory behavior.

Particularly, the research object is the mental simulation self-reflection task in correlation with the cognitive skill planning. The purpose of the study is to demonstrate mental simulation self-reflection tasks. The novelty of this methodology implies the demonstration of mental simulation self-reflection task with targeted cognitive skill planning and within certain conditions for exploratory behavior.

We address the following research question:

1. Which mental simulation self-reflection tasks can induce increased learning of foreign languages?

The rest of the paper is organized as follows: The Introduction presents and discusses the research object, purpose and novelty of the study. The Literature reviews highlights scholars'

views on self-reflection, mental simulation and conditions for exploratory behaviour. Benefits and drawbacks reveal positive and negative features of mental simulation self-reflection tasks. The part Methods includes information about methods used for research. The section Mental simulation self-reflection tasks demonstrates sets of tasks within condition of exploratory behavior. Conclusions present summaries of the research paper.

2. Literature review

There exists a considerable body of literature on the concept and types of mental simulation *(Cole, 2021; Hamrick, 2019)*. Despite various definitions, the conceptual idea that mental simulation – the capacity to imagine what will or what could be is the same one. Interactive ways of undertaking a simulation-based activity via specific devices have been proposed *(Hall, 2017; Landriscina, 2013; Landriscina, 2009)* as a suitable medium for increased learning. We support such types of mental simulation as smooth process with a negative outcome and the challenging process with a positive outcome for enhancement of increased learning of foreign languages in addressing future events which are approximate real situations *(Zhong, 2021)*.

Simulation-based learning allows students to prod at simulation issues from different directions and to be ready for scenarios and environments designed to accurately possible real situations. Thus, reseachers *(Kozyar, 2022)* experimentally confirmed the instructional effectiveness of simulation based on studies about autonomous learning and simulation training for the development of foreign language competencies of students majoring in Translation.

Students may be able to probe simulation difficulties from several angles, not just with specific simulation instruments. Unfortunately, there are no studies on the effectiveness of mental simulation self-reflection tasks without simulation training devices. Moreover, despite a rather active upgrade of insights about self reflection and mental simulation studies, their combination has not revealed specifically. Furthermore research papers contribute to the understanding of self-reflection and mental simulation in general *(Suryarini, 2021)*, but do not explore cognitive skill planning together with mental simulation and self-reflection.

In the realm of cognitive functioning, executive function plays a pivotal role in our ability to plan, organize, and execute tasks effectively. Within this framework, cognitive skill planning emerges as a crucial aspect, encompassing the ability to set goals, anticipate obstacles, and strategize for successful learning and cope with life communicative situations. Understanding the intricacies of cognitive skill planning can shed light on how we navigate the complexities of learning and achieve our desired outcomes. Cognitive skill planning is essential in various communicative situations in the learning process of foreign languages.

A number of scholars consider cognitive planning as problem-solving ability for efficient performance *(Cognitive planning, 2022)* These views are very relevant for us, because we address mental simulation self-reflection tasks in correlation with real to life planning problem-solving case studies. In particular, it seems important to expand the students' self-reflection in relation with planning as regards their cognitive enhancement in the learning process of overcoming obstacles and making errors.

Furthermore, self-reflection mental simulation tasks have emerged as a potential strategy to enhance self-regulation abilities in planning in prefrontal cortex *(Mitchell, 2011)* and reinforce neural circuits involved in learning. One of the tough challenges for us in this self-reflection domain is to adapt mental simulation self-reflection tasks in planning to conditions of exploratory behavior.

However, to the authors´ best knowledge, there are some publications about exploratory behavior but there are no research findings available in the literature that address the issue of

optimal ways to induce increased learning in the context of real to life situations in learning of foreign languages within mental simulation and exploratory behavior.

Recent literature analyses and compares various aspects of conflicting conclusions regarding effects of exploration on performance in active learning and conditions for exploratory behavior *(Hardy, 2014)*, yielded results about brain mechanisms for exploration *(Charron, 2012)*.

Taking into account the fact that it is exponentially challenging to learn for students, we have endeavoured to distinguish the following conditions for exploratory behavior

1. Tasks with complex and dynamic decision-making characteristics *(Jay H., 2014)*.

2. Error-framing instructions on exploration *(Jay H., 2014)*.

3. Specific stimulus information (what), spatial location (where), contextual information (which), observational recency and time of day (when) (*Johnson, 2012; Zhou 2009; Eacott, 2004; Dix, 1999*).

4. Peer feedback *(Karol, 2015)*.

All these conditions have been chosen by us because there is evidence-based research that has shown promotion of students' exploratory behavior in learning. By incorporating tasks with complex and dynamic decision-making characteristics, students are encouraged to think critically and explore different solutions. Error-framing instructions help students view mistakes as opportunities for learning and experimentation. Providing specific stimulus information gives students a starting point for exploration, while peer feedback allows them to receive input from their peers and further refine their exploratory skills.

3. Benefits and drawbacks of mental simulation self-reflection tasks

Mental simulation tasks allow learners to engage in realistic scenarios and practice decision-making, which can lead to improved cognitive abilities and practical application of knowledge. Thus, students get enriched in the following ways: • they become aware of their strengths and weaknesses; • they expand their cognitive skills; • they robust their metacognitive skills, particularly critically thinking skills; • it might encourage self-motivation or self-directed learning; • it may make students more responsible for their learning; • students' visualization is enhanced.

On the other hand, a drawback of mental simulation tasks is that they may require a significant amount of time and effort to create and implement effectively. Additionally, some students may struggle with the instruction of these tasks, making it challenging for them to fully engage and benefit from the learning experience and might be reluctant to accomplish these tasks because they demand much more cognitive load than just finding and recognition of mistakes.

4. Methods

To achieve the required solutions the following research methods were used: theoretical methods (analysis, interpretation and generalization), empirical methods (observation, conversation).

5. Mental simulation self-reflection tasks

The activity-based stage implies the preparation of a series of tasks in correlation with conditions of exploratory behavior which maintains curiosity and desire to learn. These tasks are aimed at integrating mental simulation through reflection and exploratory behavior in correlation with planning. We demonstrate mental simulation self-reflection tasks for the situation "Planning a trip to Canada" without and within problem-solving case study. This variation

involves presenting two types of instructions and also mixing new vocabulary and grammar with those previously mastered. Presenting unknown words in bold interspersed with known material is a much more efficient and effective form of instruction. Mental simulation is shown with the first conditional what if… The conditions for inducing exploratory behavior are followed in the next way.

1. Error-approach instruction.

1.1. There are intentionally made grammar mistakes.

Grammar mistakes. *How will I behave if I will plan everything in the **upright** way but my plans fail?* (if I will plan grammar mistake in the 1 st conditional) *What if the most challenging part of planning for travelling is **determine** what to see and where to go will be difficult for me but with positive outcome?* (determine instead of determining).*There are a bunch of information* (there are instead of there is). *When you have arrived, there was a bad weather all the time contrary to the forecast.*(There was instead of there has been).

1.2. There are the following questions which contain the word mistake and make students critically think about them in the context of the particular situation.

Which mistakes can be made by me? Which mistakes can be avoided? Which mistakes won't you make?
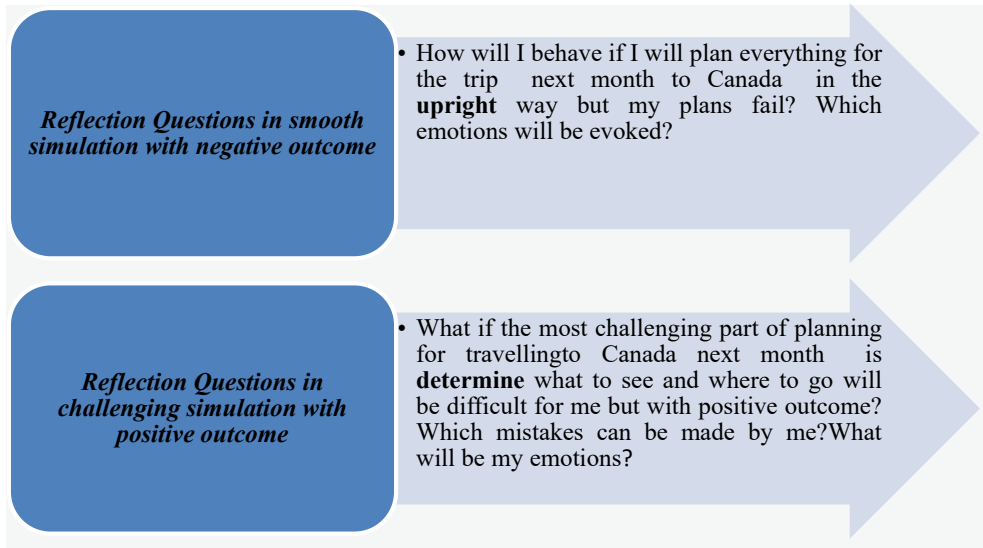
2. Tasks with complex and dynamic decision-making characteristics are demonstrated within problem-solving case study which facilitates students to find solutions for real to life problems.

3. Specific stimulus information (what-travelling -when next month-where Canada)

4. Peer feedback is determined by the following instruction. Share your responses with a partner. Give your comments for partner's answers.

Answer the following questions. Share your responses with a partner.
Give your comments for partner's answers.

| *Reflection Questions in smooth simulation with negative outcome* | • How will I behave if I will plan everything for the trip next month to Canada in the **upright** way but my plans fail? Which emotions will be evoked? |
| *Reflection Questions in challenging simulation with positive outcome* | • What if the most challenging part of planning for travellingto Canada next month is **determine** what to see and where to go will be difficult for me but with positive outcome? Which mistakes can be made by me?What will be my emotions? |

**Fig. 1. Mental simulation self-reflection tasks for the situation
"Planning a trip to Canada"**

Problem-solving case studies

- **1.** You have read long **travelogues** to avoid stress while planning for the trip to Canada next month may not really help and search for travel groups on social media sites for the places you want to visit.But too much information has caused confusion therefore when there are **a bunch of information** available on the internet and guide books, it always becomes a problem for one to choose the best holiday destination. What steps will be taken by you to avoid this confusion? Which mistakes can be avoided? Which emotions will be evoked by them?
- **2.** You have planned for the trip to Canada next month everything in the best way. When you have arrived, there was a bad weather all the time contrary to the forecast.Your emotional   stability is connected with weather. You have packed unrelated clothes and you have experienced **meltdown** from the scorching heat. What if you plan to adapt to it with minimum spending money on new clothes? How will you **mind your ps and qs**? Which mistakes won't you make? What will be your emotions?

Challenging mental simulation with positive outcome

**Fig. 2. Mental simulation self-reflection tasks for the situation
"Planning a trip to Canada" within problem-solving case study**
(challenging simulation with positive outcome)

6. Conclusions

In conclusion, this research paper delves into the concepts of mental simulation and self-reflection to enhance the learning of foreign languages, particularly English. The study emphasizes the importance of self-reflection as a tool for effective foreign language learning and presents a novel approach that combines mental simulation with self-reflection within the framework of exploratory behavior and cognitive skill planning.

The core of the paper lies in the presentation of mental simulation self-reflection tasks, exemplified in the context of planning a trip to Canada. These tasks are designed to encourage exploratory behavior and cognitive skill planning in students learning a foreign language. They include error-approach instructions, complex decision-making scenarios, specific stimulus information, and peer feedback.

The paper's main findings suggest that incorporating these mental simulation self-reflection tasks into the English language education can offer several advantages, including improved cognitive and metacognitive skills, enhanced self-motivation, and a deeper understanding of own strengths and weaknesses. However, it also acknowledges potential challenges, such as the time and cognitive load required for task implementation.

These findings not only have clear implications for theoretical understanding of mental simulation effects but may aid professionals seeking ways to induce increased learning of foreign languages. Furthermore, new research programs will benefit delineating both theoretical framework for mental simulation self-reflection tasks and their practical implications.

Given that one of the most important reasons for using mental simulation self-reflection tasks is to emphasize students' responsibility and ability to visualize and plan. When the

individuals find themselves responsible for their own learning, it increases their accuracy and attention and reduces their distraction; so lecturers, can encourage students to engage in doing mental simulation self-reflection tasks.

Another fruitful avenue for future work would be exploring another types of mental simulation in correlation with different cognitive skills that make up executive functions and consequently elaboration of new mental simulation self-reflection tasks.

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