A MIND MAP: THE TOOL OF COGNITION

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Abstract

The paper presents the detailed examination of the mind-mapping technique as one of the educational tools applied to the methodology for Political Translation classes (the aspect of The Political System of the United States of America) in the academic setting of Moscow State Institute of International Relations (MGIMO University, Russia). Over the decade there have been numerous disputes on the ways of approaching the problem of second language learning and acquisition within the framework of the key skills of the 21st century. Thus, responding to the emerging issue, the present in-depth analysis defines the skills, the role of motivation, educational context, and digital tools, which predetermine overall educational effectiveness of visual representation of the subject content incorporated into the learning process. By conducting thorough research on the topic this paper aims at bridging the gap between the mind-mapping technique potential in the academic environment and theories on learning within the scope of the present-day skills.

Keywords: Mind maps, deep learning, dynamic skill theory, second language acquisition, political translation teaching, 21-century skills.

1 INTRODUCTION

Throughout the history of second language acquisition studies there have been a number of disputes on the problem of effective methods and techniques to be applied to academic educational processes. Progressive approaches to language teaching alongside the latest advancements in digital technologies shaped distinctive framework of the 21st century skills in education, which are skills 21st century students need in order to succeed in both their studies and careers in the Age of Information. Various reference resources [1], [2], [3], [4], [5], [6] provide different rating sets of present-day skills, where critical thinking, information literacy, along with media and technology literacy are among the top priorities. In the view of the fact that information technology has been integrated into the syllabus of the institutions of higher education it has significantly modified the landscape of learning environment.

It is common knowledge that second language mastery requires both conceptual knowledge about a target language and learning process per se, which includes the stages of trial and error practice, and interaction through the perspective of personal experience: expression of thoughts, attitudes, and the sense of identity. Through transformation into something personal the second language becomes part of the self, hence providing a deeper level of learning and language awareness. A theoretical reference on how learners construct knowledge and meaning from their experiences was postulated in Constructivism learning theory by Piaget (1950). Based on the theory, mind mapping approach allows students to interrelate acquired information with the knowledge they «own» through visual representation of linked isolated notions or concepts.

Recent years has shown that educators and learners have found the use of creating mind maps on paper, or with the help of digital tools. Visual software applications and websites [7], [8], [9] have made this process more automated, and thus more efficient to apply to the academic context. The most common examples of mind map usage are brainstorming sessions, storyboarding presentation, visualising concepts, or as an ideas organiser — all these instances contribute to developing critical thinking and improving reading, speaking, and writing skills.

A mind map is a hierarchical diagram used to visually organise information [3], where associated representation of ideas are created around a central concept with images, lexical units, and key concepts branching out. The structural organisation of information in a mind map is similar to an interconnected system of ideas and concepts in our brains. While acquiring new knowledge it structures and connects the input information between the «old» and «new» knowledge and integrates it into one’s existing cognitive structure. Similarly, when perceiving and analysing new information a student uses their writing or digital tools to structurally represent and organise visual concepts for further incorporation of recycled and meaningful knowledge into their cognitive structure of the brain, thus increasing retention and recalling capacity.
2 METHODOLOGY

In this section the article aims at providing rationale of implementing mind mapping technique into high school education context. In the current and the following section the author of the article will demonstrate a link between mind mapping per se and the theories that support the approach, then, present the implementation of the Mind Map Project in two groups of students throughout the Political Translation course (the aspect of The Political System of the United States of America) and demonstrate the results of the Project. The principal focus there was on examining if the mind map method implementation improves academic performance of third year International Journalism students. The project is divided into three stages (S1, S2, S3), where a test finalises each of them. Thus during the project the students took three tests (T1, T2, T3). Before the start of the project the students from Group 1 (G1) were instructed in the guidelines for creating mind maps. They took tests each time after the course material of S1, S2, or S3 was covered and the mind maps for each stage were created. Conversely, Group 2 (G2) students performed S1 without mind maps; after receiving the S1 test results it was decided to implement mind mapping in S2 and S3 in order to record the difference between S1 and S2, S3 in test performance. G2 was instructed in the guidelines for creating mind maps before S2 and S3. The students from both groups proved to be computer literate, therefore they were provided with the list of online tools and advised on the applications and computer-based programmes for creating mind maps. Some of the students preferred traditional hand-writing to digitally assisted tools.

Mind mapping, as a method of structuring information through text analysis and keyword selection, or a tool that integrates ways of thinking into its own structure, has been widely in use since the late 1970 after being popularised by Buzan [10], although the earliest examples of such graphical records were developed by Porphyry of Tyros in the 3rd century [3]. The usage of mind maps in learning environment has proved a positive effect on the process of learning by a number of research [11], [12], [13], [14], [15]. This efficacy might be contributed to similar information structure depicted on a sheet of paper or a computer screen, that happen inside a human brain. The basic units which organise and structure information are schemata [3]. Whereas some single pieces of knowledge are acquired randomly, the deeper learning occurs at the level of schema. Schema is ‘an internal representation of the world; an organisation of concepts and actions that can be revised by new information about the world’ [16]. Schemata provides connections and links among the ideas and facts thus builds up sensible and meaningful «big picture», a framework for future understanding.

To create a «topical language picture» the schemata principle in mind mapping might be of use for a thoughtful educator. For instance, a student understands that a schema for US Congress exists, the information in terms of a congress having chambers, members and a speaker might occur in their mind, so before the reading of the text about The US Congress this basic schema might be created in a form of a draft mind map. Hence, on reading ‘The Senate is the upper chamber in the bicameral legislature known collectively as Congress…’ [17], learners might insert the newly acquired knowledge into the mind map they have already designed. In cognitive science a schema describes ‘a pattern of thought or behaviour that organises categories of information and the relationships among them’ [18]. Thus it influences how students absorb new knowledge, organise newly perceived information in schemata, understand the changing environment and embed updates quickly in the mind map.

The mind map practical usage is extensive and might be implemented in various learning activities. For example, as a form of note-taking, or organising vocabulary sets and visual concepts while Reading or Listening; in Writing and Speaking mind maps are used for reasoning. The students’ bespoke schemata provide a structured and easy-to-reproduce content, which can be easily customised. The latter factor enables the information in the mind maps to be imprinted on the brain of a student: a mind map creates links, it creates imagery, which lead to improvement of retention capacity of the brain, and promotes critical thinking through text analysis.

To explain the mechanism of learning the author will refer to the ideas of dynamic skill theory (DST) developed by Kurt Fisher [19] which utilises the ideas of Piaget. The main focus is on the four levels of organisational complexity. DST describes these levels as (a) single set, where a student acquires discrete knowledge and individual skills learned separately; (b) mapping, in which meaningful connections are made between single elements; (c) system, develops when the connections in the previous stage exceed critical level, triggering the system of connections function together holistically at a higher order skill; and the final (d) system-of-systems, the highest level of organisational complexity that integrates all the systems of knowledge. Likewise, the process of learning a foreign language study begins at level (a), then proceeds to (b), (c) and finally (d): a set of lexical units and grammar rules connected in meaningful ways are used to build up sentences; the sentences to the ideas, the ideas are interconnected to create a broader picture which comprises the language awareness, multicultural
aspects and professional expertise. Recognising the significance of DST, the similarity in the mechanisms of structuring information internally, inside a brain, and externally, using a mind map, utilising fundamental principles of holistic approach to language study, which engage learners differently through experience of trying a new method, mind map experiment and psychological approach to acquiring a language, the Mind Map Project was implemented in G1 and G2 during Political Translation course. The aim was to achieve positive performance in understanding the complex and intricate system of the US political world.

Following the instruction on the mind map method G1 was advised to build up a map on *The US Congress* text [17] as a part of their home assignment to summarise the key ideas of the text (Fig. 1). Most of the participants were aware of the technique as a strategy to improve memory retention, thus motivation to build up the map was relatively high at S1, S2, S3. The participants shared their previous positive experience of implementing the method as a tool to foster deep learning. High level of enthusiasm might also be explained by the fact that G1 participants believed the mind map method would improve their test performance.

G2 underwent S1 without implementing mind mapping approach and studied the system of the US Congress using conventional methods of learning materials of the course, mainly cramming before T1. Before S2 and S3 the participants of G2 were instructed in mind mapping technique. Some of the students appeared to be reluctant to implement new approach in S2 and S3, though the majority seized the opportunity to improve their academic performance.

### 3 RESULTS

During S1, S2 and S3 sessions participants of G1 noted academic improvement after they received positive test results (Table 1) and their results, along with their motivation, grew at S2 and S3. The G1 students noticed the efficacy of the method that might be explained by the processes that induce deeper understanding and learning.

G2 using conventional methods of recycling information at S1 proved low efficacy compared to G1 at the same stage. However G2 welcomed mind map approach at S2 as a new approach to improve academic performance, notwithstanding the initial reluctance to extra assignment. Further at S2 and S3 the performance significantly improved.

![Figure 1. The US Congress.](image)

<table>
<thead>
<tr>
<th>Table 1. G1 and G2 achievement during S1, S2, S3.</th>
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<tr>
<td><strong>S1, Test 1, % (max 100)</strong></td>
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<td>Group 1</td>
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4 CONCLUSIONS

Throughout the Mind Map Project various topics on the Political System of the United States of America were studied, revealing various types of organising the information flow of the course (Fig. 2), (Fig. 3). The way participants visualised concepts revealed their personality types and corresponding effective ways of memorising information. The incorporation of a mind mapping approach into the academic environment proved motivation increase and overall positive performance. Further studies should be undertaken to evaluate long-term viability of the mind map method integrated into the course of Political Translation classes.

![Figure 2. Visual representation of «checks and balances» system in the US Congress.](image)

![Figure 3. Visual representation of the US political system.](image)

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REFERENCES


