

Use of chess playing in international logistics training

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Abstract: The use of game training methods is an ancient practice. Today, the potential of these methods is very high, incl. thanks to new technologies that enable fast connection and reliable simulation of case studies. By accurately reflecting life and, in particular, rivalry, chess is the game that offers the largest range of possibilities. His connection to military affairs makes him extremely suitable for training in international logistics, whose relationship with military affairs is indisputable. A number of examples from history show the importance of logistics in military campaigns. Key points in chess accurately reflect the importance of logistical factors for success. The complex rivalry of today to master key points in order to control important trade routes and supply lines can be successfully simulated with chess models. Especially the Three-player chess reflects best today's reality – the rivalry between major players in a multipolar world. Hence the use of chess playing in international logistics training could be very useful.

Keywords: gaming methods; chess; international logistics; warfare; simulation

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1. Game and game methods - principles and applicability

The game is a method of learning, laid out by nature in many higher animals, incl. in the human. It is a type of simulation that requires active participation. It simulates the real activity in one or another artificially created situation. The participants either perform certain roles or are active spectators. Its purpose is to form skills and habits for real action. The game can be funny and engaging, facilitating the acquisition of new knowledge and enhancing brain capacity in this regard by engaging with emotional memory.

It helps to promote communication effectively, so it is a particularly appropriate method of creating an atmosphere of trust, but also of a competitive spirit - healthy competition, etc. among participants. In role-playing, participants tend to fuse in their minds the hypothetical and the real with respect to some activity or function, and as a result, study it while playing. They simulate a particular situation to play out what they have mastered or play in order to develop new abilities. Underlying role-playing is the

understanding of social roles. They are seen as forms of behavior through which an individual learns and constructs his or her social life. Everyone is socialized, i.e. everyone learns about the behavior that the community expects from it.

In competitive games, such as chess, the participant seeks to prevail over another person by arguing within clear rules. In this way the game develops social skills for the participants: for communication, for cooperation, for negotiation and for resolving conflicts.

Playing methods have many advantages in training, including in higher education. Efficiency (measured in amount of time) is 4-5 times higher than traditional methods.¹ The games are suitable for both individual training and team preparation. The performance of individual tasks requires the contractor to specify in advance the limits of his own capabilities and then, on the basis of his initial individual indicators, to solve specific tasks depending on the situation. Simulators in initial driving training e.g. rely on the skills acquired in computer games. They save the risk of damage or crashes in real life.

Teamwork training is of increasing complexity, as it clarifies the boundaries of one's own capabilities by specifying the boundaries of the associates' capabilities, as well as the rules and opportunities for interaction. Simulators in initial flying training - previously designed for teams of 4-5 people, recently - for two, exemplify this feature. Among other things, this type of training emphasizes the role allocation and develops teamwork and communication skills, promotes combining forces for a common purpose, and is accustomed to adhering to certain rules adopted by all.

The games help to reinforce the connection between theory and practice by providing models for solving practical problems in a simulated environment. In the simulation, the participants perform certain activities in conditions close to those of the actual situation. The method is useful when some tasks require practice but it is not possible to perform the activity in real terms. This saves time and resources, while avoiding the danger of absorbing knowledge and skills only at the abstract level, and avoiding entering into a real environment where making the wrong decisions in the learning process may cause unacceptable damage. Simulation can only be part of the training activity. It needs to be brought as close as possible to the actual conditions so as to allow the participant to directly transfer the acquired knowledge and skills into reality.

2. Chess - features and benefits of training

Chess is a popular game of problem solving, evaluation, critical thinking and planning. It is a game of hypothesis and experimentation. In terms of the number of possible moves, it is second only to the "go" game. However, it is the most complex in terms of the diversity of resources available to both parties.

History

Chess is believed to have originated in Eastern India, c. 280–550, in the Gupta Empire², where its early form in the 6th century was known as chaturanga. Chess spread eastward and westward along the Silk Road. The earliest evidence of chess in Central Asia is found in the Sasanian Persia around 600, where the game came to be known by the name chatrang. After the Islamic conquest of Persia (633–

44) chatrang became popular in the Muslim with the name shatranj, with the pieces largely retaining their older Persian names.³

As already mentioned, chess is one of the many war modeling games. Its connection to military affairs is most pronounced, as can be seen from her first Indian name, describing the four military divisions – infantry, cavalry, elephants, and chariotry, represented by the pieces that would evolve into the modern pawn, knight, bishop, and rook, respectively. Indeed, players have full-fledged "army" models, including different "sorts of troops" with different firepower and maneuverability. Victory in the party cannot be achieved without the proper interaction of the different kind of "troops", and victory itself can be achieved only by meeting the conditions that are valid also in the actual battlefield - interruption of enemy communications, breakthrough, backstabbing and encirclement, destruction of enemy forces, capture of the enemy commander.

After finalizing and harmonizing the rules, the strategy of chess remains the same and is based on setting and achieving long-term goals during the party - for example, mastering the center or challenging and exploiting weaknesses in the enemy's position, etc. The same remains the way tactical short-term actions lead to the achievement of strategic goals.

During the Middle Ages and during the Renaissance, chess was part of the culture of the aristocracy. It has been used to teach military strategy and has been called the "royal game". Over time, the game's popularity has increased, and it is necessarily present in the training of commanders today, despite the great changes within the armed forces over time. Because of the qualities it develops and nurtures, it is now used not only in the armies to train the minds of cadets and officers, but is also taught to children in many schools around the world as part of the compulsory curriculum. In 1999 the International Olympic Committee also recognized chess as a sport and even had exhibition games held at the Sydney 2000 Olympics.⁴

Chess and common educational skills

The game of chess could be an excellent educational tool in the universities too, because of the way chess can incorporate and relate to core academic subjects. The Educational Value of Chess lies in promoting decoding and analysis, thinking strategically, and foreseeing the consequences. Chess can improve comprehension and social interaction. It is one big science experiment - every time participants play a game they are testing hypotheses, experimenting and learning by trial and error. Through chess, players are required to think abstractly, analyze concretely and plan while juggling multiple considerations simultaneously.

Chess is a game of problem solving and evaluation. One of the essential goals of education is to teach students critical original thinking and planning skills. Research suggests that students playing chess learn concepts through physical and visual stimuli and correlate these concepts to cognitive patterns. During a game a player must formulate a plan of attack or defense. To effectively do this the player must evaluate the results of a specific action and sequence. Players are taught to pursue long-range goals and the need to reevaluate plans, considering all of the factors. They learn to be guided by logic rather than impulse and must analyze concretely.⁵

Studies have shown a strong correlation between learning to play chess and academic performance by involving a whole range of cognitive skills including analysis, planning, forward thinking, memory and a knowledge of history. Smith and Cage (2000) proved that students who received chess instruction scored significantly higher on all measures of academic achievement, including math, spatial analysis, and non-verbal reasoning ability.⁶

One of the key educational benefits is raised IQ scores. There have been a number of studies which have proven the benefits of chess in terms of results. Many studies, among them studies in Venezuela and Pennsylvania, proved, that studying chess two to three times per week caused a significant increase in both memory and verbal reasoning skills, especially amongst the more competitive players. Mathematics is where the biggest link between chess and education can be seen. Mathematics is more than equations and numbers. Mathematics is not only algorithms, but also pattern recognition and analysis of patterns. Chess is a game of prediction, calculation and pattern recognition. Predicting consequences and pattern recognition are key elements of both mathematics and chess. Attempts in New Brunswick, Canada in the early 90's to add chess to the maths curriculum, proved that chess, built into a part of the maths curriculum, significantly raised the problem solving scores of the students, when compared to the students who undertook the regular maths curriculum.⁷

Logical and sequential thinking are also encountered in chess and are possibly the two most important aspects when calculating combinations. Sequential thinking comes into practice when planning ahead and working out sequences, whilst logical thinking is used when reacting to opponents' plans, and working out the proper response. These two attributes are both heavily linked to maths where using logic is important. Because of these features chess is also a part of the curriculum in many countries, such as: Armenia, Paraguay, Belgium, Venezuela, Russia, Hungary, Turkey, Zaire, parts of the USA and Canada.⁸

Chess and Social Skills

Chess often serves as a bridge, bringing together people of different nationality, races, and genders in an activity they can all enjoy. Learning to interact socially is of great importance in a diverse environment. Chess allows players to develop friendships with other players, regardless of whether they are in the same class, or even in the same country. Internet connection enables organizing international tournaments or at least seeking new friends and exchanging positive experience. Due to the new communication tools chess is one of the mostly widely available games or

sports in the world. As and journalist says "There is no other activity that costs so little to organize and that cuts across so many barriers." (Malcolm Pein, International Chess Master)⁹ The game helps to overcome barriers in a culturally diverse group, as often represented by the teams of companies in the logistics industry.

3. Logistics and chess

The relationship between Logistics, incl. International Logistics, and chess is in two dimensions.

General connection Chess - Exact Sciences

Due to the direct connection between chess and maths, as mentioned above, chess can be used as a teaching method in all the science and academic disciplines that come on a rational basis. Logistics work with many quantitative parameters, which in this case are calculated in a complex search for a rational solution. Logistics is generally the detailed organization and implementation of a complex operation and the New Oxford American Dictionary defines it as "the detailed coordination of a complex operation involving many people, facilities, or supplies".¹⁰ As such, logistics is commonly seen as a branch of engineering that creates "people systems" rather than "machine systems".¹¹ The logistics of physical items usually involves the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, and often security. It organizes and controls the optimal allocation of all kinds of production factors.¹² The goal is to combine the various factors at the right place and time at the lowest possible cost and thus ensure a lasting advantage over competitors / rivals.

Specific link - logistics, war and chess

Historically, logistics originated in ancient Greece as a military concept, encompassing processes for the full support and security of troops in combat - the supply of food, weapons and more materials, including transportation and storage, construction and maintenance of communications and transport infrastructure. Hence the older definition of the Oxford English Dictionary described logistics as "the branch of military science relating to procuring, maintaining and transporting material, personnel and facilities".¹³

In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy is a crucial element of military strategy, since an armed force without resources and transportation is defenseless. Military logistics was developed already in the ancient world and as modern military have a significant need for logistics solutions, new technologies and method have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed using new communication and transportation tools. The historical leaders Hannibal, Alexander the Great, and the Duke of Wellington are considered to have been logistical geniuses: Alexander's expedition benefited considerably from his meticulous attention to the provisioning of his army, Hannibal succeeded to control

long supply routes during the Punic Wars and the Duke of Wellington effectively supplied his Anglo-Portuguese army in the Peninsula War, despite outnumbered by the enemy. The defeat of the British in the American War of Independence and the defeat of the Axis in the African theater of World War II are attributed by some scholars to logistical failures.¹⁴

4. International logistics, rivalry and war

Following the foregoing on the relationship between logistics and war, international logistics is part of any large-scale rivalry to achieve economic and political supremacy over others, whether it is only economic or full-fledged war. And the connection of chess to these problems is obvious - the rivalry model that sets the game up is so complete that often in describing the big clashes mentioned above, chess terms are used - the most popular example being the work of Zb. Brzezinski "The Grand Chessboard" (1997) describing the rivalry between the Anglo-Saxon world and Russia in Central Asia.

There are many examples from the beginning of written history about how the change in trade routes, most often caused by conscious human activity, rearranges the economic and political map of the world, causing ruin and decline in some places, and in other places an upsurge and lasting domination. At one point, Central Asia was relatively economically advanced between 800 and 1100 AD, in fact the center of the world - present-day Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan are located along major trade routes linking East Asia with Europe, with rich "super-cities" (e.g. Balkh), where science and the arts flourished. This flowering continued until the 14th century and ended with the Tamerlane Empire.

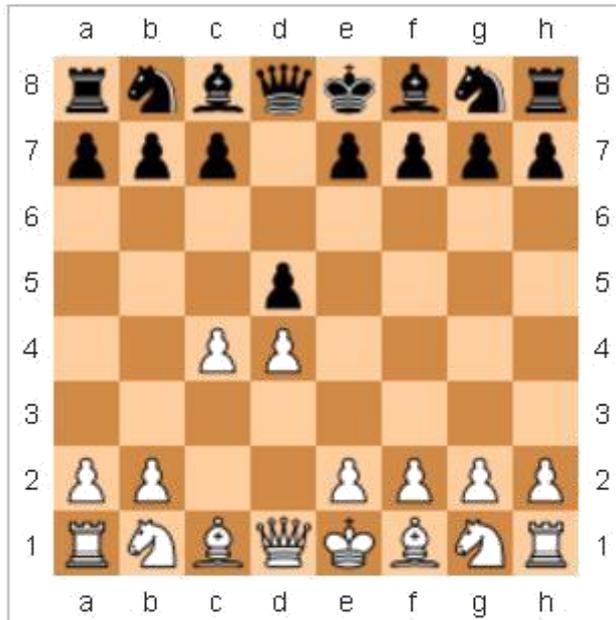
The conquest of Constantinople in 1456 by the Turks and the imposition of high levies on trade between the East and the West made these countries (especially the energy-deprived ones) an "economic black hole", a permanent part of the world periphery, with a brief exception during the existence of the USSR. The Turks' attempt to impose a commercial monopoly compelled traders from the Atlantic coast of Europe - Portuguese, Spanish, and later Dutch, British, French, to seek alternative routes. This became possible with the advent of 14th century of Carrack, the first large three-masted sailing ship designed for long ocean voyages and allowing the transport of heavy and expensive goods. The previously used camel caravans with intermediate stations became after the 15th c. unable to compete with the maritime transport, and this initiated the great "maritime empires" - the Spanish, Dutch, French, British, nowadays the empire of the United States.

Trade routes and communications link different regions and cultures into one macroeconomic space, provided that there are logistical solutions that combine these requirements. In practice, because of the unresolved logistical problems until the 19th century (the "opium wars against China, the powerful "opening up" of Japan) the notion of "world economy" sounded conditional. Until then still existed relatively isolated from the rest of the world societies of greater or lesser potential for development. The world economy is now a fact and the rivalry between the great powers also reflects the attempts to control major trade routes and intersections.

Control of trade routes involves military bases, escorts, inspections and technical restrictions and other military means, which in general complicate logistical decisions and increase trade costs. However, these costs are inevitable. Security considerations have a broader dimension and often conflict with free trade regulations. However, a review of historical events shows that these considerations are often justified. Dependence on external food supplies e.g. pose an unjustifiably high risk to national security. This is how it was in the Roman Empire after Egypt was incorporated into it and became a major supplier of grain to Italy.

Putting Egypt and these supplies under control became the preferred scheme for usurpers of the imperial throne. Many countries in the Middle East, Sub-Saharan Africa and Japan are now vulnerable to food supply. This vulnerability can trigger or exacerbate political crises in countries such as Venezuela, Yemen and Qatar. So controlling key communications justifies the extra cost. Likewise at chess, control of important fields is sometimes worth the sacrifice of material that is then paid for. On this basis, a number of popular chess debuts exists, the so-called gambits:

Fig.1: Queen's gambit



Queen's Gambit: 1.d4 d5 2.c4. If Black takes the pawn (...dxc4), White can move e2–e4 and take control of the center, while threatening to capture the black pawn with the bishop (Bxc4).

Source: <https://en.wikipedia.org/wiki/Gambit>

The reluctance to relinquish control can be expressed in the abandonment of foreseeable immediate profits. Such considerations delayed the construction of the Channel Tunnel for a long time. In the 17th century, the so-called navigation acts (bans on the use of foreign ships in trade and shipping) led to two wars between England and the Netherlands, and set in motion a policy of protectionism that made England a leading maritime and commercial power, despite its technological backwardness at that time. The pursuit of access to trade routes across the Baltic and Black Seas, e.g. determine permanently the foreign policy of Russia from the time of Peter the First (1672 - 1725) until now.

The pirates cutting the link between Spain and its colonies in America contributed greatly to the decline of the Spanish empire. In its heyday, the British Empire relied on three key points - Singapore, Suez, and Gibraltar, and in the two world wars it was vital to maintain control over supply across the Atlantic. Currently, the world domination of the United States depends on control of the Panama Canal and the Strait of Hormuz.

Global rivalry also implements the strategy of interrupting communications between rival forces (allied countries) and/or preventing such communications from being established. In the so-called "rook middlegames" most often the main objective is to split the enemy forces vertically:

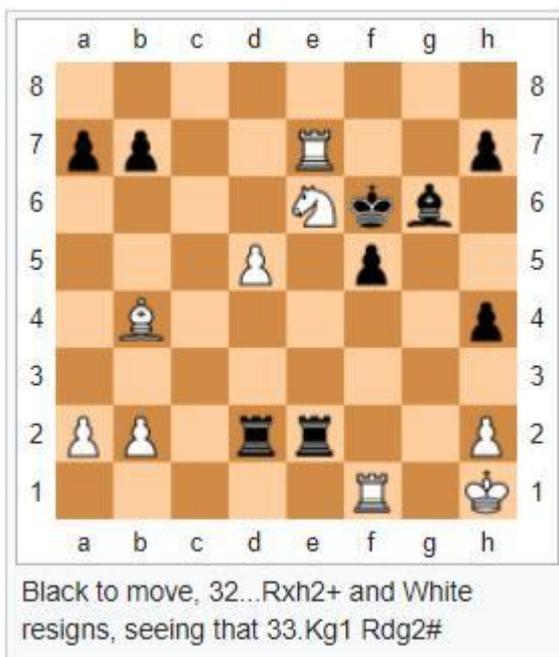
Fig.2: Nimzowitsch vs Rubinstein, Dresden 1926



Source: <https://www.chessgames.com/perl/chessgame?gid=1007481>

... or "cutting off" the enemy king from the rest of the forces horizontally, which leads to victory despite numerical equality:

Fig.3: Chigorin vs. Steinitz, Havana 1892



Source: [https://en.wikipedia.org/wiki/Rook_\(chess\)](https://en.wikipedia.org/wiki/Rook_(chess))

These principles of the game reflect some of the oldest rules in military strategy and tactics. Reflecting on the world domination of the United States since 1990, Brzezinski saw the main threat to it in uniting all the resources of the Eurasia mainland. As the center fields (d4, d5, e4 and e5) in "The Grand Chessboard" he refers to the so-called "Eurasian Balkans", that means several relatively weak and dependent

countries of the Middle East and Central Asia. Controlling them would allow the US to control the trade routes and energy supplies between China and Europe, preventing a geographically viable union between potential rivals. The restoration of the ancient Silk Road through the Chinese "One Belt One Road" project is technologically feasible and economically viable today. This also explains the attempts at US military anchorage in Afghanistan and elsewhere. Today the United States maintain two bases in Central Asia, one each in Uzbekistan and Kyrgyzstan, for its postwar operations in Afghanistan. Logically a regional group led by Russia and China uses pressure to the United States to remove its forces from Central Asia.

Fig.4: U.S. military bases in Central Asia and the Middle East



Source: <http://www.heartland.it/>

These anchor points are able to break one of the land sections of the "OBOR", the so-called "Eurasian Bridge" and the "OBOR" maritime section across the Indian Ocean to the Red Sea. Another part of the strategy in question envisages impeding the rapprochement between Russia and Germany, in fact the old strategy of Britain since the 19th century. Thus, the old major commercial axis of Novgorod (St. Petersburg) - Santiago de Compostela has been severely interrupted in the last 100 years by two "hot" world wars (1914-1918 and 1939-1945) and two "cold wars" (1945-1990 and 2014 onwards). Countering energy corridors linking Russia and Germany, e.g. ("Nord Stream" 1 and 2) is carried out with the active assistance of Poland, the Baltic States and Denmark, and their alliance with the United States in this opposition is also called exactly "chess union" in the theory of international relations. The Three Seas Initiative, launched in 2016 (also known as the Baltic, Adriatic, Black Sea Initiative) aims at connecting the Adriatic Sea, Baltic Sea, and the Black Sea, building two major infrastructure projects in the region:

- A north-south highway "Via Carpathia", connecting Klaipėda in Lithuania with Thessaloniki in Greece;
- Liquefied natural gas infrastructure, with sea terminals in Poland and Croatia and a connecting pipeline¹⁵,

... cutting off the “East-West” transport and energy connection, replacing it with the “North-South” route.

Similar local rivalries have led to the civil war in Syria: plans to launch a Pan-Arab gas pipeline (Qatar-Saudi Arabia- Jordan-Syria-Turkey) have clashed with Iran's attempts to bring its supplies across Syria to the Lebanese coast of the Mediterranean.

In many cases, more than two countries are involved in the competition, each one with their own interests, even during the bipolar system of international relations. At present, the United States, China and Russia emerge as major power centers in a multipolar world, treated in a complex system of rivalry and cooperation. The orientation in the new complex environment could be eased through of exercises with Three-player chess. Three-player chess (also known as three-handed, three-man, or three-way chess) is a family of chess variants specially designed for three players. The variations of three-player chess use a non-standard board, for example, a hexagonal or three-sided board that connects the center cells in a special way.

Fig.5: Three-player chess



Source: https://en.wikipedia.org/wiki/Three-player_chess

Three-player chess variants (as well as other three-player games) are difficult to design fairly, since the imbalance created when two players gang up against one is usually too great for the defending player to withstand.¹⁶ This situation, however, reflects more precisely the real life (e.g. “The strategic triangle USA –USSR or Russia – China) and helps students to understand better the tactical alliances, positions changes and surprising moves on “The Grand Chessboard” of the world politics”. Since the theory of this variant of chess is not so developed, the students could enjoy additional by contributing the further development, playing the “pioneers”.

Conclusion:

The use of game training methods is an ancient practice. Today, the potential of these methods is very high, thanks to new technologies that enable fast connection and reliable simulation of case studies. By accurately reflecting life and, in particular, rivalry, chess is the game that offers the largest range of possibilities. His connection

to military affairs makes him extremely suitable for training in international logistics, whose relationship with military affairs is indisputable. The complex rivalry of today to master key points in order to control important trade routes and supply lines can be successfully simulated with chess models.

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