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## **Impact assessment of the Chess Palace skills development programme**

There are many different ways of introducing chess into education, and European Chess Union experts are working to investigate which forms of chess education in schools are effective. In other words, it is not a question of whether chess is useful in schools, but of examining the methodologies and understanding the cognitive developmental impact of chess so that it can be used in a more targeted way to develop skills.

Judit Polgár's Chess Palace Programme differs from previous school chess teaching methods. She does not teach chess, but teaches through chess. Children learn to play chess, but it is such a natural thing that you don't really have to do it, it's not the goal, it's just a given factor. Judit Polgár puts chess back into its original function, adding that chess as a teaching tool facilitates the transfer of the curriculum by developing cognitive skills. A very important aspect of her method is that it is not the game of chess, but chess as a system of rules that is introduced into the teaching. The teacher does not need to understand the game of chess, only to know its rules. In the method, chess is not a stand-alone activity, but a background to the processing of the curriculum.

### **Examination of the Cognitive Developmental Effects of the Chess Palace Program**

In this impact assessment, we examined the cognitive developmental effects of the Chess Palace Program using the Online Cognitive Profile Test with participants from grades 3 and 4. The majority of the classes participated in the Chess Palace Program, while the remainder did not. The study utilized test data from a total of 698 students in chess classes and 102 students in non-chess classes. The schools involved in the study had diverse backgrounds, including institutions from Budapest, large cities, and small towns.

A higher proportion of chess classes (78%) included students with special educational needs (SEN) compared to non-chess classes (60%). Regarding socio-cultural background, the chess and non-chess samples had approximately equal average SES indices. There were no significant differences between the groups in terms of students' age and gender. Both chess and non-chess groups included specialized classes; however, a greater percentage of non-chess classes (40%) were specialized compared to chess classes (17%).

Overall, the characteristics of the two groups were not substantially different, though the above-mentioned discrepancies should be considered.

### **Summary of the Study, Conclusions, and Suggestions**

Based on the study results, we evaluate our five hypotheses, draw conclusions, and provide suggestions.

**Hypothesis 1:** Students in the Chess Palace Programme Achieve Better Results in All or Almost All Areas of Cognitive Development

The data unequivocally support this hypothesis. Students in the Chess Palace Programme consistently achieved superior results across most indicators of the Cognitive Profile Test compared to non-chess students. This finding is robust despite the higher proportion of specialized non-chess classes, which suggests that the Chess Palace methodology provides added value beyond pre-selection advantages. Previous studies on mathematical competency also corroborate these findings, showing better performance among students in the Chess Palace Programme.

**Hypothesis 2: The Most Pronounced Effect Appears in Intellectual Abilities, Primarily in Abstraction Abilities**

The results clearly demonstrate that students in the Chess Palace Programme exhibit superior development in intellectual abilities, particularly in abstraction. Chess students outperformed in all tasks assessing intellectual abilities, with notable advantages in verbal abstraction. This is particularly significant for socio-culturally disadvantaged students, as proper verbal development is crucial for school success, addressing a common barrier among these students.

**Hypothesis 3: Learning in the Chess Palace Programme Increases Information Processing Efficiency**

This hypothesis is largely supported by the results. Chess students performed better in tasks assessing information processing, particularly in auditory memory. This advantage may stem from the sequential auditory information processing required in chess. The method appears to enhance auditory memory, providing significant benefits, especially for students with special educational needs (SEN), although this does not always translate into statistically significant differences.

**Hypothesis 4: The Effect of the Chess Palace is More Pronounced in Arithmetic Abilities than in Literacy-Related Ones**

Contrary to the hypothesis, the study found significant advantages in verbal abilities rather than arithmetic. While previous assessments showed better mathematical performance among chess students, the current study focused on counting abilities rather than broader mathematical thinking. The chess group's superior performance in figural abstraction and literal abilities suggests that the Chess Palace Programme effectively supports linguistic development alongside intellectual abilities.

**Hypothesis 5: Learning in the Chess Palace Programme is Advantageous for Students with Special Educational Needs or Disadvantaged Socio-Cultural Backgrounds**

The results indicate that non-SEN chess classes outperform their non-chess counterparts. Chess-programme SEN classes also performed better than non-chess SEN classes, especially in tasks related to dyslexia, such as pseudoword and word spelling. However, analysis of sociocultural disadvantage was limited due to insufficient SES data. Further research is needed to explore the impact of the Chess Palace Programme on socio-cultural factors.

An additional finding is that chess students spent more time on test tasks, suggesting greater willingness to exert mental effort, likely attributable to chess training. The benefits of the Chess Palace Programme were observed across diverse classes and schools, highlighting its potential for broad cognitive development, especially for SEN students.

The Chess Palace Programme has demonstrated significant benefits in cognitive development, particularly in intellectual and verbal abilities. Given these findings, it is recommended to

- Expand the Chess Palace Programme to more schools.
- Provide support to teachers using the Chess Palace methodology to enhance teaching effectiveness.

Further research should focus on the impact of the programme on socio-cultural factors and continue to monitor its long-term benefits for diverse student populations.