

## INSIGHTS ON TEACHING CHESS TO UNDERGRADUATE UNIVERSITY STUDENTS *PERCEPÇÕES SOBRE O ENSINO DE XADREZ PARA ESTUDANTES DE GRADUAÇÃO*

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**Abstract:** The purpose of this study was to explore how undergraduate university students react to chess instruction. Certain patterns emerged from 10 offerings of a Freshman Seminar entitled “Beginners’ Chess and 21st Century Thinking Skills”. The course enrolled only first-year and second-year undergraduate students at a large public state university in the USA. The students tended to have little or no knowledge of chess prior to the course. The course made extensive use of chess-related websites available on the Internet such as chess.com, lichess.org, and chessgames.com. The instruction involved the projection of a chess-related website projected onto a large classroom screen with the use of an instructor’s computer connected to a projector that projected the computer-based image onto the screen. The course had 10-20 students in each annual offering of the course that lasted 15 weeks. The student evaluations of the course were very positive, indicating that the students enjoyed the course very much. The course involved instruction in chess on topics such as tactics and basic checkmates along with instruction on the cognitive psychological foundations of chess on topics such as problem solving and critical thinking. The primary task in the course was that each student had to prepare a critical evaluation of two of their own chess games that included correct usage of proper algebraic notation for the chess moves. The chess activity that the students enjoyed the most was group competition.

**Keywords:** Undergraduate students, chess instruction, group competition, chess-related websites, thinking skills

**Resumo:** O objetivo deste estudo foi explorar como estudantes universitários de graduação reagem ao ensino de xadrez. Certos padrões emergiram de 10 ofertas de um Seminário para Calouros intitulado “Xadrez para Iniciantes e Habilidades de Pensamento do Século 21”. O curso matriculou apenas alunos de graduação do primeiro e segundo ano em uma grande universidade pública estadual nos EUA. Os alunos tendiam a ter pouco ou nenhum conhecimento de xadrez antes do curso. O curso fez uso extensivo de sites relacionados ao xadrez disponíveis na Internet, como chess.com, lichess.org e chessgames.com. A instrução envolveu a projeção de um site relacionado ao xadrez projetado em uma grande tela de sala de aula com o uso de um computador de instrutor conectado a um projetor que projetava a imagem baseada em computador na tela. O curso teve de 10 a 20 alunos em cada oferta anual do curso com duração de 15 semanas. As avaliações dos alunos sobre o curso foram muito positivas, indicando que os alunos gostaram muito do curso. O curso envolvia instrução em xadrez sobre tópicos como táticas e xeque-mate básicos, juntamente com instruções sobre os fundamentos psicológicos cognitivos do xadrez em tópicos como resolução de problemas e pensamento crítico. A principal tarefa do curso era que cada aluno preparasse uma avaliação crítica de dois de seus próprios jogos de xadrez, que incluía o uso correto da notação algébrica adequada para os movimentos de xadrez. A atividade de xadrez que os alunos mais gostaram foi a competição em grupo.

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**Palabras-chave:** Estudantes de graduação, ensino de xadrez, competição em grupo, sites relacionados ao xadrez, habilidades de raciocínio.

## **1 INTRODUCTION**

The purpose of this study was to explore how undergraduate university students respond to chess instruction. Chess instruction is usually oriented toward school-aged children (e.g., CAPABLANCA, 1994; COAKLEY, 2000; SADLER, 1999; SCHLOSS, 2014; SEIRAWAN, 2003; STEAN, 2002; WEERAMANTRY & EUSEBI, 1993; WILSON, F. 1994). No books could be located that are specifically for teaching chess to undergraduate university students. Also, no books could be identified specifically for undergraduate university students to learn chess.

The motivation for this study is the belief that chess training can facilitate the development of 21st Century thinking skills among undergraduate students. Many undergraduate students lack 21st Century thinking skills. Chess requires 21st Century thinking skills such as skills at critical thinking, problem solving, decision making, planning, and creative thinking. To explore how undergraduate university students respond to chess instruction, 10 offerings of a Freshman Seminar entitled “Beginners’ Chess and 21st Century Thinking Skills” were implemented and examined to determine whether certain patterns of undergraduate behavior emerged.

## **2 DEVELOPMENT**

### **2.1 Method**

#### **2.1.1 Participants**

Only students enrolled in the Freshman Seminar were participants in the study. The participants were only first-year and second-year undergraduate students at a large public state university in the USA. The students tended to have little or no knowledge of chess prior to the course. The Freshman Seminar had 10-20 students in each annual offering of the course that lasted 15 weeks. Thus, there were approximately 150 participants in the study.

### **2.1.2 Instrument**

The university Student Ratings of Teaching (SRT) questionnaire was used as an instrument in the present study and served as the course evaluation questionnaire. This instrument is used to assess the quality of teaching in a course, not the quality of the course content. The SRT questionnaire included five items: (1) I have a deeper understanding of the subject matter as a result of this course; (2) My interest in the subject matter was stimulated by this course; (3) Instructional technology employed in this course was effective; (4) The grading standards for this course were clear; and (5) I would recommend this course to other students. A 6- point Likert-style was used for student responses. The options were as follows: 1= not applicable, 2=strongly disagree, 3=Disagree, 4=Somewhat disagree, 5=Agree, 6=Strongly agree.

### **2.1.3 Procedure**

The course made extensive use of chess-related websites available on the Internet such as chess.com, lichess.org, and chessgames.com. The instruction involved the projection of a chess-related website projected onto a large classroom screen with the use of an instructor's computer connected to a projector that projected the computer-based image onto the screen.

The course always occurred in a classroom in which there were an instructor's computer connected to a projector and a large screen as well as a computer at each student location. After the students received a set of introductory lessons, students would play chess games with each other with the use of either the computers available near their seats or physical chess sets that they would bring to class. The students tended to play chess games with each other with the use of the computers located on the tables near their seats.

The course entailed 15 course lessons offered in each semester-long offering. Each course lesson was 2.75 hours in length. There was one course lesson per week for 15 weeks.

The course involved instruction in chess on topics such as tactics and basic checkmates along with instruction on the cognitive psychological foundations of chess on topics such as problem solving and critical thinking. The primary task in the course was that each student had to prepare a critical evaluation of two of their own chess games that included correct usage of proper algebraic notation for the chess moves.

In addition to the critical evaluations of two of their personal chess games, the students also were asked to prepare final reflection papers in which they indicated what they liked about the course and what ways, if any, the course helped to improve their thinking skills. The students were awarded course points for their completed final evaluation papers.

At the end of the last course lesson for each offering of the course, a volunteer student selected by the instructor from the group of students in the class served as the proctor for the final evaluation of the course teaching by the students. After the instructor left the class, the volunteer student gave a course teaching evaluation questionnaire to each student in the class. The questionnaire is called the Student Ratings of Teaching (SRT) questionnaire. The students were asked to complete the SRT questionnaire to evaluate the teaching in the course. The instructor was not present when the students completed the SRT questionnaire. After the students completed the SRT forms, the volunteer student collected the completed the SRT forms and gave them to a departmental staff member who sent them to an agency in the university for data analysis.

The university requires SRT questionnaire usage with each university course. The university collects the completed SRT measures and analyzes the results that are given to departmental administrators and the course instructors. The instructor of this course received the SRT results for each offering of the course.

## **2.2 Results**

The SRT reports for each offering provided clear evidence that the students in each offering uniformly and consistently thoroughly enjoyed the

course. The SRT means were all between 5 (Agree) and 6 (Strongly Agree). The offerings of the course regularly received high Student Ratings of Teaching results. Also, In many of the final reflection papers for each offering, students attested that their thinking skills improved as a result of the course.

The students tended to be quite competitive. They wanted to play chess games with each other during class. They tended to get along and enjoyed the class environment. The instructor celebrated good moves made by students. The instructor indicated that all chess players inevitably lose games. The students accepted the emphasis on personal growth in chess rather than winning games at all cost.

The activity most enjoyed by the students was team competition. The students would be subdivided into two teams (e.g., an East team and a West team). The teams would play chess against each other with members of each team taking turns making a move. Members on a team were allowed to offer advice to the team member making the move.

The instructor would enter each move on the instructor's computer and project the game on a large classroom screen with use of the chess.com game board so that the entire class would be able to see the game. The instructor would serve as the impartial referee and would comment periodically on the game positions. The instructor set a time limit of 2 minutes for each move.

The students would get very excited during these team games. Active student engagement was a major characteristic of the course. In addition, another result of the course is that students thoroughly enjoyed the course.

### **2.3 Conclusions and Recommendations**

Five recommendations emanate from this inquiry. One, universities and colleges worldwide should provide chess training to students in their institutions. Many undergraduate students lack the mental skills fostered in chess instruction. The cognitive skills developed in chess would likely benefit undergraduates in their other university or college coursework. Among the cognitive skills that chess develops are skills at decision making, problem solving, planning, critical thinking,

and even creative thinking. Those cognitive skills are valued and useful in undergraduate educational settings and in professional life.

Two, chess instruction for university undergraduate students should involve team competition. Undergraduates tended to be very competitive and social. An instructor of chess for undergraduates may have one group of students play chess against another group of students with students in both groups taking turns making moves. Students tend to enjoy such games as they learn how to work together. Chess instruction can help undergraduate students learn to work cooperatively to achieve certain goals. Such capacity to form teams to work cooperatively and harmoniously is another attribute highly valued in many professions.

Three, the chess instruction should make extensive usage of computer technology and computer-based websites. Undergraduates tend to be quite savvy with computers and enjoy using computers and viewing chess-related websites freely available on the Internet. The chessboards available on chess.com and lichess.com are especially useful in class instruction, as they are clear to the viewer and permit the movement of pieces on the chessboard. The instructor of chess can illustrate many concepts and ideas in chess such as castling and checkmate with the use of those web-based images.

Four, there should be research on why social activities in chess training are so popular among undergraduate university students. Also, there should be research on the determination of the social and cognitive benefits to undergraduate university students of chess instruction and the social activities in chess instruction.

Five, there should be research on the mental health benefits of chess instruction. Undergraduates can be under stress in colleges and universities as they attempt to complete courses of instruction in a timely and successful manner. Learning and then playing chess can be a form of recreation and relaxation that can lead to a reduction in stress for the undergraduate students. Learning and playing chess can even be enjoyable to undergraduates that can then account for the widespread interest and motivation that many chess players have for playing chess.

### 3 FINAL CONSIDERATIONS

Chess instruction for chess beginners or chess novices is relatively uncommon, but, with the host of chess-related websites and computer-based technology, perhaps the time has come for chess instruction in collegiate and university settings in order to facilitate the development in undergraduate students of higher order 21st Century thinking skills such as skills at critical thinking, decision making, planning, and problem solving. Those higher order thinking skills are required in order to play chess at even an intermediate level of chess competency. Many undergraduate students lack those higher order thinking skills.

Chess instruction is likely a practical, useful, and efficient form of instruction that should be implemented in universities and colleges worldwide. Also, chess instruction for undergraduates in universities and colleges provides a potentially highly generative and interesting setting for research on the scientific study of chess and on the improvement of critical thinking skills and other higher order thinking skills among undergraduate students.

One type of research study that could be considered in that regard would involve an experiment group whose undergraduate members would receive chess instruction and a control group whose undergraduate members would not receive chess instruction. Undergraduate students would be randomly placed in the two groups. Student participants in both groups would be tested with a critical thinking test prior to the chess instruction and then again immediately after the chess instruction. The post-test critical thinking test score means for the control and the experimental groups could be compared with the use of an analysis of covariance using the pretest critical thinking test scores of the participants in the two groups as the covariate. If it is determined that the post-test critical thinking test score mean for the experimental group is significantly greater than the post-test critical thinking test score mean for the control group after controlling for the variation among pretest critical thinking test scores, then that will provide evidence that chess instruction promotes the development of critical thinking skills among undergraduate students.

That study is but one example of a research study that could be designed to examine empirically the cognitive effects of chess instruction among collegiate and university students. Based on student comments in the final reflection papers submitted by students in offerings of the university chess-related Freshman Seminar, collegiate and university courses of chess instruction have tremendous potential to facilitate the development of critical thinking skills and other higher order thinking skills in students. Research is needed to examine and to investigate that cognitive potential of chess instruction for university students.

Although the benefits of chess instruction for undergraduates may be plentiful, significant, and widespread, there is a caution that warrants attention. Students can and will periodically lose when playing chess. Losing at chess can lead to negative feelings of personal incompetence and failure. Losing at chess can even predispose students to avoid chess. Instructors of chess need to indicate clearly to undergraduates that everyone inevitably loses at chess and that includes even Magnus Carlsen, the present World Chess Champion. Losing at chess can be a positive experience for an undergraduate student if the student learns why the loss occurred and learns how to play chess better as result of the game loss. Both wins and losses at playing chess can lead to chess improvement for undergraduate students. The instructor of chess needs to provide instruction that addresses both inevitable game losses and wins among undergraduate students in a positive and productive manner.

In conclusion, chess instruction in colleges and universities has substantial potential to enhance and enrich the education of undergraduate students.

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