The affect of computer and internet supported chess instruction on university students

Ramiz Arabacı[1]

Abstract

The purpose of this study was to teach subjects of "The King and Rook Checkmate" and "Two Bishops Checkmate" in chess with a computer program on a web page and compare the computer - internet supported instruction method with traditional instruction method. For this reason, an experimental group (n=33, mean age=22.1 years) and a control group (n=35, mean age=22.6 years) were set up from participants of non-major Elective Chess course (VIII) taught in Uludag University, Faculty of Education, Department of Physical Education and Sports. As subjects of application, the fundamental chess topics of "The King and Rook Checkmate" and "Two Bishops Checkmate" were selected. After chess instruction of 2 hours every 5 weeks, the topics of "The King and Rook Checkmate" and "Two Bishops Checkmate" were taught to both groups in 6th and 7th weeks respectively. While traditional instruction methods were applied to control group, internet and computer supported education was given to experimental group. After the lessons, the students of both groups were asked to make "The King and Rook Checkmate" and "Two Bishops Checkmate". The analysis of the obtained data were made on SPSS 12 statistic program and evaluated with Chi – Square test. Significance level was accepted as $p<0.05$. 72.7% of the students in the experimental group and 54.3% of the students in control group learned the "The King and Rook Checkmate" topic. 69.7% of the students in the experimental group and 62.9% of the students in control group learned the "Two Bishops Checkmate" topic. As a result, can say that computer and internet supported chess instruction is more effective and efficient compared to traditional methods. Investigation on the effect of computer and internet supported instruction method on other subjects in chess was purposed.

Key words: Chess, multimedia, teaching method

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Bilgisayar ve internet destekli satranç öğretiminin üniversite öğrencileri üzerine etkisi

Ramiz Arabacı

Özet

Bu çalışmanın amacı, satrançta "Şah kale matı" ve "Şah iki fil matı" konularının bir web sayfasında hazırlanan bilgisayar programı ile öğretilmesi ve bilgisayar - internet destekli öğretim yönteminin geleneksel anlatım öğretim yöntemiyle karşılaştırmaktır. Bu amaçla, Uludağ Üniversitesi, Eğitim Fakültesi, Beden Eğitimi ve Spor Bölümünde okutulan Bölüm Dışı Seçmeli VIII – Satranç dersine katılan öğrencilerden deney grubu (n=33, ortalama yaş = 22.1 yıl) ve kontrol grubu (n=35, ortalama yaş = 22.6 yıl) oluşturuldu. Uygulama konusu olarak satrancın temel konularından olan **"Şah kale matı"** ve "Şah iki fil matı" seçilmiştir. 5 haftalık 2'şer saat temel satranç eğitiminden sonra iki gruba da 6. haftada **"Şah kale matı"** ve 7. haftada ise "Şah iki fil matı" konusu anlatıldı. Kontrol grubuna geleneksel öğretim metotları uygulanırken, deney grubu internet ve bilgisayar destekli eğitim verilmiştir. Derslerden hemen sonra her iki grupta yer alan öğrencilerden **"Şah kale matı"** ve "Şah iki fil matı" yapmaları istendi. Elde edilen verilerin değerlendirilmesi SPSS 13 paket programında Ki kare testi ile yapıldı. Anlamlılık seviyesi olarak $p<0.05$ değeri olarak kabul edildi. "Şah kale matı" konusunu deney grubunda yer alan öğrencilerin %72.7' si (n=24) öğrenirken ($p<0.05$), kontrol grubunda yer alan öğrencilerin %54.3'ü (n=19) öğrenmiştir ($p>0.05$). "Şah iki fil matı" konusunu deney grubunda yer alan öğrencilerin %69.7' si (n=23) öğrenirken ($p<0.05$), kontrol grubunda yer alan öğrencilerin %62.9'u (n=22) öğrenmiştir ($p>0.05$). Sonuç olarak bilgisayar ve internet destekli satranç öğretiminin geleneksel anlatım yöntemlere göre daha etkili ve verimli olduğu söylenebilir. Bilgisayar ve internet destekli eğitiminin satrancın diğer konularının eğitimindeki etkisinin de araştırılması önerilmektedir.

Anahtar Sözcükler: satranç, multimedia, öğretim yöntemi

Introduction

Chess is an ancient game that is popular all over the world. In some countries, *chess* instruction in the schools is common because *chess* requires high-level thinking skills (e.g., strategy building, problem solving, and spatial thinking) and improves the ability to concentrate. In addition, it provides motivation, independent critical thinking, an increased understanding of cause-effect relationships, patience, and self-reliance (Christiaen & Verholfstadt, 1978; Gelb & Keene, 1997; Horgan, 1987; Horgan, 1990; Horgan & Morgan, 1986; Horgan & Morgan, 1990). In developed countries, chess instruction has been included in school education for a long time. In our country, as a result of the protocol signed between Ministry of Education and Turkish Chess Federation, chess was started to be taught as an elective course in elementary schools in 2005-2006 academic year (http://www.tsf.org.tr). As chess instruction entered our school curriculums, discussions about chess teaching methods began.

Scientific and technological advancements in 21st century have affected education-instruction field as much as social life, economics and communications. We see that approaches and methods used in chess instruction are parallel to technological inventions and scientific advancements. The advancements in information technology are certainly one of the most important advancements today. "Personal Computer" technology (audio + video + recording + interaction = multimedia) has been used in chess instruction frequently in developed countries in the light of other advancements since 1980s. Various softwares are developed for chess instruction and education. With communication and computer networks or Internet becoming widespread around the world starting in 1990s, chess sites have been designed on these networks as well. Thus, individual and distance education concepts appeared in this field as well.

The tremendous growth in telecommunication has brought online services, specialized electronic networks, WebPages, E-mail, software and global information resources to our homes as well as to schools. The Internet provides an environment in which millions of people participate and engage in the creation and exchange of information (Rose & Fernlund, 1997). Internet use has become very popular in many areas as well as in education in recent years. Accordingly, Internet access in schools has increased greatly over the last 20 years (Berson, 2000).

Many experts see the personal computer with its speed and power, combined with multimedia capabilities, as the new tool that can transform teaching in colleges of business. Multimedia has the potential to extend and enhance the use of interactive learning modules in teaching (Doughty, 1995). A real benefit of multimedia is that the student cannot take a multimedia course passively. The student must interact with multimedia as the course changes depth and direction (Olaniran, Savage & Sorenson, 1995). To maximize the instructional effectiveness in a multimedia environment, educators must remember two basic features of learning. First, students learn more often through social interactions; and second, the nature of the Net and the Web encourages superficial explorations of data. Educators must develop teaching strategies that ensure the development of the habit of intensive reading in this new learning environment (Leu, 1996). Another plus is that the information can be geared to match the student's capabilities (Holden and Holmes, 1995). Many experts see the computer, combined with multimedia capabilities, as the new tool that can transform education. Van Horn (1991) points out that the computer can solve many of the problems facing teachers. In today's environment the teacher is expected to have a large knowledge base. The teacher also has the problem of deciding to teach at the low end or the high end of the grade level. Many compromise and teach in the middle. Computers can solve these two problems by enabling teachers to customize instruction for each student (McKeown, 1991).

Every instruction method applied in education-instruction process has advantages and disadvantages. When the applied method fits the subject to be taught, the benefit we get will certainly be the highest. In recent years, it was possible to create visually rich education programs and share them with students in necessary situations by using computer technology and Internet. When we consider that computers and Internet are education materials that students are most attracted to, computer and Internet supported education will come forward as one of the most beneficial instruction methods that we can use. Benefiting from computer applications make learning easier in subjects where many problems are encountered when teaching with traditional instruction methods. The subjects of "The King and Rook Checkmate" and "Two Bishops Checkmate" chosen for this study have an important place in chess education-instruction and contain many events that students have hard time to imagine. The purpose of this study is to teach subjects of "The King and Rook Checkmate" and "Two Bishops Checkmate" in chess with a computer program on a web page and compare the computer - Internet supported instruction method with traditional instruction method.

Method

Research Design and Sample

This research concerns the measurement of the effect of computer and Internet supported education of two chess topics on chess learning of university students. For this reason, a control group of 35 student (mean age=22.6) and an experimental group of 33 student (mean age=22.1) were set up from participants of non-major Elective Chess course (VIII) taught in Uludag University, Education Faculty, Department of Physical Education and Sports. As subjects of application, the fundamental chess topics of "The King and Rook Checkmate" and "Two Bishops Checkmate" were selected. Initially, no students in the experimental and control groups knew the chess rules. In first five weeks of the education-instruction term, the fundamental chess rules – topics such as movements of pieces, capturing pieces, checkmate were taught. After chess instruction of 2 hours every 5 weeks, the topics of "The King and Rook Checkmate" and "Two Bishops Checkmate" were taught to both groups in 6th and 7th weeks respectively. While traditional instruction methods were applied to control group (explanation and demonstration methods with chess board), Internet and Computer supported education was given to experimental group by using www.chesskids.com/level2/cl5l7.htm web page. After the lessons, the students of both groups were asked to make "The King and Rook Checkmate" (Figure 1 and 2) and "Two Bishops Checkmate" (Figure 3 and 4).
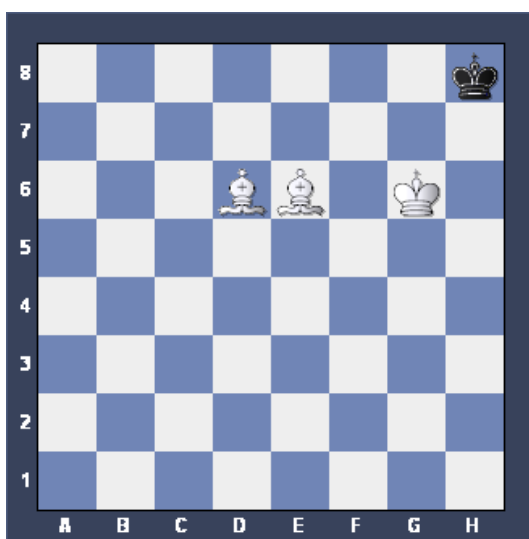
Figure 1. Two Bishops Checkmate   **Figure 3. The King and Rook Checkmate**
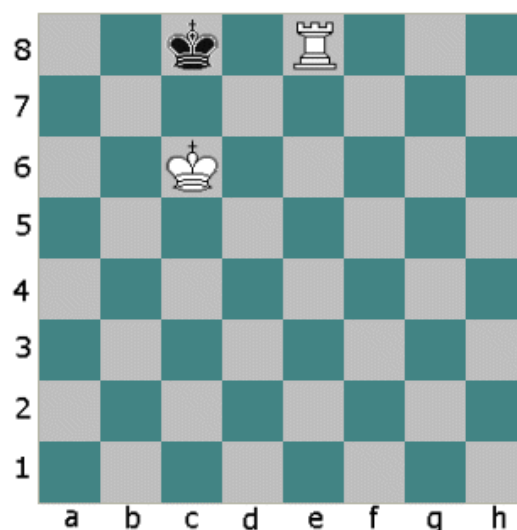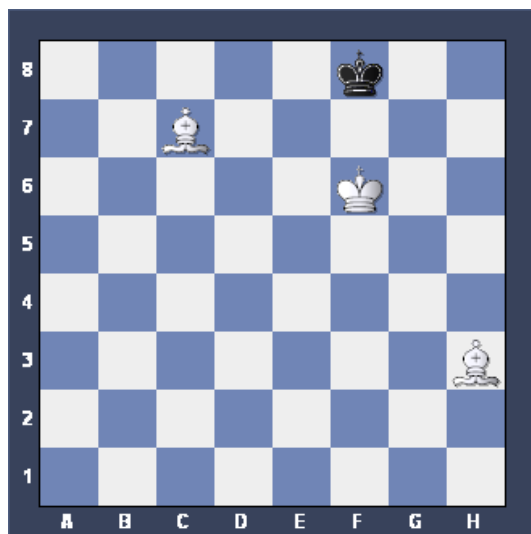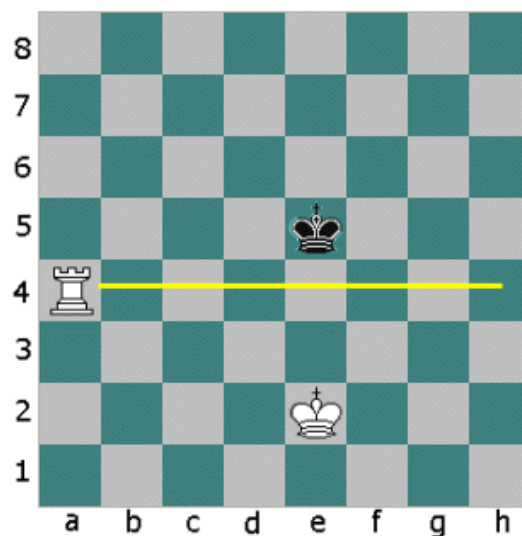
Figure 2. Two Bishops Checkmate   **Figure 4. The King and Rook Checkmate**

Data Analyses

The analysis of the obtained data were made on SPSS 12 statistic program and evaluated with Chi – Square test. Significance level was accepted as p<0.05.

Results

Results and comparisons are shown in Table 1 and 2.

Table 1: Experimental and Comparison Group's status of learning The King and Rook Checkmate topic.

Group		Learn		No Learn		Chi - Square	P
		N	%	N	%		
Experimental Group (n=33)*		24	72.7	9	27.3	6.818	p<0.05
Comparison Group (n=35)**		19	54.3	16	45.7	0.257	p>0.05

* : Internet and Computer Supported instruction method has been applied.
**: Traditional method has been applied (oral instruction and chess board).

As seen in Table 1, 72.7% (n=24) of the students in the experimental group learned **The King and Rook Checkmate** topic while 27.3% (n=9) didn't learn (p<0.05).   54.3% (n=19) of the students in control group learned **The King and Rook Checkmate** topic while 45.7% (n=16) didn't learn (p<0.05).

Table 2: Experimental and Comparison Group's status of learning "Two Bishops Checkmate" topic.

Group		Learn		No Learn		Chi - Square	P
		N	%	N	%		
Experimental Group (n=33)*		23	69.7	10	30.3	5.121	p<0.05
Comparison Group (n=35)**		22	62.9	13	37.1	2.314	p>0.05

* : Internet and Computer Supported instruction method has been applied.
**: Traditional method has been applied (oral instruction and chess board).

As seen in Table 2, 69.7% (n=23) of the students in the experimental group learned the "Two Bishops Checkmate" topic while 30.3% (n=10) didn't learn (p<0.05). 62.9% (n=22) of the students in control group learned the "Two Bishops Checkmate" topic while 37.1% (n=13) didn't learn (p<0.05).

Discussion

One of the actively used technologies in the education system is computer supported education. No scientific research has been found about computer and Internet supported chess instruction after a broad literature scanning. However many researches have been done today about the effect of computer and internet on education-instruction. In these studies, it was found that the success with computer supported education was higher than with traditional education method (Chang, 2002; Hacker and Sova, 1998; Yalçınalp, Geban, and Özkan, 1995).

Several studies suggest that interactive multimedia training is more effective in a shorter period of time than traditional teaching methods. A Department of Defense study revealed that training provided through multimedia is roughly 40 percent more effective than traditional methods with a retention rate that is 30 percent greater and a learning curve that is 30 percent less (Dvorak and Seymour, 1991).

Research showed that computer and the Internet supported teaching strategies have crucial roles facilitating development of students' critical thinking, problem solving and decision making skills (Berson, 1996; Rice & Wilson, 1999; Adiguzel & Akpinar, 2001).

Kıyıcı and Yumuşak (2005) have established in their research that computer supported instruction is more effective in increasing student success in science laboratory course than traditional method. Computer usage helps the teaching of subjects and lessons in education programs in a manner that would respond to students' research and learning

demands (Soylu ve İbiş, 1998). During the applications, researchers have observed that computer supported activities increase students' interest to the course, decrease the time needed to reach learning and instruction goals, and make the students more active in the class. In addition, it was observed that experimental applications in the virtual environment help the students understand the points they need to pay attention during laboratory applications better.

Çekbaş et al. (2003) state in a study that while before the application there were no significant differences between control and experimental groups in the examination that determines theoretical and experimental readiness level, after the application the experimental group has been significantly more successful than the control group.

Willis (cited in Nickell, et al., 2001) mentioned three studies conducted in middle and high schools. These studies suggested that students who use technology in social studies demonstrated better communication and language skills, and discussions that involve higher order thinking.

Becker (2000) reported a 1998 national survey of teachers, called "Teaching, Learning, and Computing (TLC)" and discussed some of the findings of this survey as they relate to the questions raised by Cuban's critique. According to the TLC survey results, a majority of the teachers said they know how to use a World Wide Web search engine. Most teachers also said they need software to prepare handouts, write lesson plans and record, and calculate grades.

In our research, 72.7% (n=24) of the students in the experimental group learned "The King and Rook Checkmate" topic while 27.3% (n=9) didn't learn (p<0.05), as opposed to 54.3% (n=19) of the students in control group learned "The King and Rook Checkmate" topic while 45.7% (n=16) didn't learn (p<0.05). 69.7% (n=23) of the students in the experimental group learned the "Two Bishops Checkmate" topic while 30.3% (n=10) didn't learn (p<0.05) as opposed to 62.9% (n=22) of the students in control group learned the "Two Bishops Checkmate" topic while 37.1% (n=13) didn't learn (p<0.05). The results we obtained from this study are parallel to and support the results of the studies mentioned above.

There are some limitations to this study. It was conducted in only with one teacher and sixty seven university students. The results cannot be generalized to other schools or classrooms. In addition this application concerns only two topics in chess (Two Bishops Checkmate and The King and Rook Checkmate).

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As a result, we can say that computer and Internet supported chess instruction is more effective and efficient compared to traditional methods. Furthermore, studying the effects of computer, internet and multimedia tools supported chess teaching methods on other chess topics could be recommended for future research.

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