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The Effects of High School Course Taking and SAT Scores on College Major Selection

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Abstract

A survey study design was employed to examine the relationship between enrollment in computer and Advanced Placement courses during high school, SAT scores and subsequent selection of a STEM major in post-secondary education. Study data were collected through an online survey from a multi-school charter school system in which a variety of computer courses are offered to 9-12 grade students. The study showed that students' scores on the SAT reading section and, total composite score (reading + mathematics) had a statistically significant relationship with students' selection of a science, engineering, technology, and mathematics [STEM] major. Although there was not a statistically significant relationship between students' SAT mathematics scores, there was a pattern showing that students with higher SAT mathematics scores were more likely to choose a STEM major. We also found that there was a statistically significant relationship between the number of AP science courses and total number of AP courses taken by students and their selection of a STEM major. The final analysis revealed that there was no statistically significant difference between those who chose STEM majors and the number of computer courses taken.

Keywords: STEM interest, AP courses, SAT, Major selection

Üniversite Alan Seçiminde Lisede Alınan Derslerin ve Sınav Puanlarının Etkisi

Bu araştırmada, lise öğrencilerinin bilgisayar dersleri ve İleri Yerleştirme (İY [AP]) derslerine katilimi, Bilimsel Yetenek Sınavı (BYS [SAT]) puanları ve sonrasında gelen üniversite eğitiminde Fen, Teknoloji, Mühendislik ve Matematik (FTMM [STEM]) alanlarından birini seçmeleri arasındaki ilişki incelenmiştir. Çalışmadaki veriler, çevrim-içi uygulanan anket ile 9-12 sınıflarda okuyan öğrencilerden toplanmıştır. Araştırma sonuçlarına göre, öğrencilerin BYS okuma bilgisi puanları ve toplam puanları (okuma + matematik) öğrencilerin FTMM alan secimi ile istatistiksel olarak anlamlı bir ilişki göstermiştir. Öğrencilerin BYS matematik puanları ile diğer değişkenler arasında istatistiksel olarak anlamlı bir ilişki olmamasına rağmen, BYS matematik puanı yüksek olan öğrencilerin FTMM alanlarından birini seçmesinin daha büyük bir olasılık olduğu bulunmuştur. Bunlara ek olarak, öğrencilerin İY fen derslerini seçme sayısı ile toplam aldıkları tüm alanlar için İY derslerinin sayısı ve FTMM alanı seçmeleri arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur. Ayrıca öğrencilerin FTMM alanlarından birini seçmesi ile alınan bilgisayar dersi sayısı arasında anlamlı bir ilişki bulunamamıştır.

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Introduction

In order to stay competitive with other nations and continue as a leading economic and innovative power, the United States government has issued a number of policies to create ways to encourage growth in the number of students choosing careers in Science, Technology, Engineering, and Mathematics (STEM) (Obama, 2009; President's Council of Advisors on Science and Technology, 2010). For example, the government under President Obama recently enacted a number of policies designed to boost the number of American born students graduating with degrees in STEM (2009). However, the larger and more complicated problem is how to address the factors that lead students to choose STEM-related careers.

Career selection is one of the most important choices affecting students' lives (Borchert, 2002). For many adolescents, choosing a career pathway is not an easy process. There are several factors influencing the career decision making process including: (1) the context in which students live, (2) the culture that they have been brought up with, (3) aptitudes, (4) attitudes of other people (i.e. parents, teachers, counselor, etc.), (5) past experiences, (6) gender differences, and (7) educational attainment (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Borchert, 2002; Dick & Rallis, 1991; Ferry, 2006; Meece, Parsons, Kaczala, Goff, & Futterman, 1982), (8) expected earnings one receives upon completion of college (Berger, 1988), and (9) students' interests and motivations (George-Jacson & Lichtenberger, 2012). Researchers have found that interest differs by gender; therefore, to some extent, course enrollments mirror those interests (Linn & Hyde, 1989).

Two academic preparation and course enrollment factors influencing postsecondary STEM major choices are students' Advanced Placement (AP) course taking and performance on standardized tests such as state-based proficiency exams, the Scholastic Aptitude Test (SAT), and the American College Testing (ACT) (George-Jacson & Lichtenberger, 2012). Research has found that students who took more college preparatory mathematics and science classes in high school had higher scores on college entrance exams (Brody & Benbow, 1990; McClure, 1998). From this perspective we may assume that taking AP course and college entrance exams (i.e. SAT) during high school years affects students' educational attainment and hence career choices. Because acceptance into postsecondary STEM majors is affected by a number of factors (Teachman, 1987), the focus of this study is on factors that literature cites most frequently in STEM career selection: students' academic preparation (i.e. SAT taking) and course work (i.e. Advanced Placement courses) (George-Jacson & Lichtenberger, 2012; Ma, 2011).

Theoretical Framework

Overview of STEM Matriculation

The domestic need for labor in STEM fields is rapidly increasing in the U.S. According to the National Science Foundation (2010), the unemployment rate for the 12-month period between September 2008 and 2009 dramatically increased from 6.1% to 9.7%. However, the employment rate for science and engineering workers displayed a 3.3% increase. On the other hand, the American College Testing (ACT) (2006) reported that the percentage of students who were willing to choose engineering fields decreased from 7.6% to 4.9% between 1996 and 2006. The percentage of students who were willing to choose computer and/or the information sciences decreased from 4.5% to 2.9% between 2001 and 2006. Thus, there is definitely a need for students to pursue STEM

disciplines in postsecondary education (Wang, 2012).

Researchers, utilizing a national dataset, found that 14.7% of high school graduates chose STEM-related fields in their postsecondary education, while 60.8% chose alternative fields, and 24.5% did not declare a major in 2006. The students making up the 14.7% pursuing STEM-related fields were described as mostly: male, Asian/Pacific Islander, younger (age 19 or younger) and dependent, foreign, economically advantaged, from educated families, and academically well prepared (i.e. took trigonometry, precalculus, or calculus in high school) (Chen & Weko,2009).

STEM Interest

Motivational theories of STEM interest have two vital components: interest and self-concept (Beier, 2008). Interest was defined as "relatively stable preferences that are focused on objects, activities, or experiences" (p. 1). Interest in students' school life has a direct effect on learning performance and is correlated with course selection, achievement, and persistence in a specific discipline (Beier, 2008). Research has shown that interest and self-concept of different genders toward STEM related fields have an impact on students' major choices in higher education (Halpern et al., 2007; Seymour & Hewitt, 1997). Results of these studies echoed the literature emphasizing that male students were interested in science and mathematics, while females were most likely to study language arts and social sciences.

In order to increase interest in STEM among all students, Beier (2008) identified five interventions. The first intervention was to provide structured and well-organized science and math courses because classroom management is positively related to students' interest. The second intervention was providing achievement experiences because achievement in a domain positively affects students' self-concepts. The third intervention was integrating interesting materials with instruction and grouping students wisely. The fourth was organizing learning environments outside the classroom to provide achievement experiences and role models. Finally, the fifth was placing students in classrooms according to their academic levels because high-achieving students can be negatively affected when they advance to the next level.

Students' STEM interests may also be affected partially by their perception of occupations and the earnings of the careers that they are planning to pursue (George-Jacson & Lichtenberger, 2012). Potential earnings influence Asian women's choices of a STEM major more than White women, particularly for Chinese, Filipino, and Southeast Asian women (Song & Glick, 2004). In contrast, White women value familial obligations as exclusive priorities so they prefer jobs that are flexible for temporary leaves to enable them to raise a family (Hanson, 2004). In addition, students of color tend to prefer jobs that will enable them to serve their community instead of choosing careers based on personal economic gain (Bowen, Kurzweil, & Tobin, 2005). This permits females and students of color to recognize STEM majors as non-beneficial in fulfilling their expectations thus resulting in this group not choosing STEM majors (Bonous-Hammarth,2000)

Advanced Placement Courses and Major Selection

The U.S. College Board created the AP program in 1955 with the motto of *Connecting Students to College Success* for the purpose of preparing students for an academically more challenging college curriculum. Advanced Placement courses are a curricular option for those high school students who are academically superior. "Naturally,

courses offered in the program are more demanding in terms of time and intellectual skills than corresponding courses in the regular high school curriculum" (Postsecondary Education Planning Commission, 1988, p. 1). AP courses began as a program for elite private school students to take college-level courses while still in high school so they can begin college with course credit earned and potentially graduate earlier.

According to the data released by the 7th AP Report to the Nation, the number of seniors taking at least one AP course and scoring 3 or more on AP exams has improved in recent years (College Board, 2011) (See Table 1). These increases were partially due to growing awareness of the program and the benefits of taking AP courses including the significant role of AP courses in the college admission process (Reichard & Keirn, 1999). In addition, the *No Child Left Behind Act* (U.S. Congress, 2001) offers states substantial federal funding, $24 million annually, to expand AP programs with underserved populations

Table 1

Students Success on AP Exams Today Compared to Those Taking Exams from 2001 – 10

Year exam was administered	Number of seniors leaving HS having taken an AP Exam	Number of seniors scoring 3+ on an AP exam at any point in HS
2001	432,343	277,865
2006	646,310	403,150
2009	797,629	478,973
2010	853,314	508,818

Previous studies looked at the relationship between students' AP course taking and their career choices. Students who take AP physics classes during their high school years tend to choose STEM majors at higher rates in comparison to non-AP physics students (Robinson, Fadali, Ochs, & Willis, 2002). AP science and calculus classes were positively correlated with students STEM career choices. Students' gender, ethnicity, and socioeconomic status were not found to influence choices of STEM career majors. In fact, both minority and non-minority students, who took AP calculus and science classes were more likely to pursue majors such as science, engineering, mathematics, and the medicine (Robinson, 2003). Recent studies funded by the College Board also found that students who participated in AP science, math and technology coursework in high school were far more likely than other students to pursue a STEM-related discipline (Morgan & Klaric, 2007). Thus research confirms a link between AP course taking and STEM college major selection. This study, in addition to the AP factor in STEM career choice, aims to examine the effects of college entrance exam (SAT) score in students' career choice decision-making process.

SAT Scores

The Scholastic Aptitude Test (SAT) is a useful indicator of how students will perform in post-secondary (College Board, 2011) experiences. SAT scores are concrete and uniform indicators of prior educational attainment, on which, in part, university admission decisions are made. Additionally, colleges often use these scores as a major determining factor in college admittance (Goldman & Hewitt, 1976). The SAT measures students on mathematics, critical reading, and writing with scores ranging from 600 to 2400 with a maximum of 800-points from each section. Students from 9th grade to 12th grade can take the SAT. The College Board (2011) has stated that a combination of SAT scores and high school grade point average (GPA) were a good predictor of post-secondary success. Additionally, some

researchers have found that students who were successful in high school mathematics and on the SAT most likely preferred scientific majors to nonscientific majors (Astin, 1993; Sells, 1973; Simpson, 2001).

We investigated the relationships between: a) student enrollment in AP mathematics, science, and social studies and regular computer courses, b) student SAT mathematics, reading, and composite (reading + mathematics), and (c) SAT total scores and students' major choices. Previous studies (Porter & Umbach, 2006; Semela, 2010) have only examined the impact of undergraduates' course taking on their career choice. This study uses high school students' computer and AP course enrollment data and SAT scores to examine their effect on students' STEM major selection.

questions framing this study are:

1. Is there a statistically significant difference between students' SAT mathematics, SAT reading, SAT composite (reading + mathematics), and SAT total scores and their choice of STEM major?

2. Is there a statistically significant difference between students' enrollment in AP mathematics, AP science, and AP social studies courses and their choice of STEM major?

3. Is there a statistically significant difference between students' enrollment in computer courses and their choice of STEM major?

Method

Participants and Data Collection

This study examined the graduates of the charter school system's class of 2011. Data were collected from a charter school organization located in south-central Texas, in which eight of their campuses had graduates during the 2010-2011 year. We conducted a survey to collect their graduation status, demographic information (gender, ethnicity, and lunch status related to socioeconomic level), major choices, SAT scores (if applicable), and AP course enrollment. Out of the 149 graduates, n = 126 of them provided their AP and SAT information. All students' (n = 149) demographics, graduation status, and STEM major choices are displayed in Table 2 by demographics.

Table 2

Participant Demographics by Percent

#Students	Male	Female	Hispanic	Black	White	Asian	ED
149	48	52	52	6	21	17	65

Note. ED=Economically Disadvantaged

Course offerings in Texas public high schools.

Texas provides three types of graduation plans: (1) minimum, (2) recommended, and (3) distinguished. This particular charter school does not offer their students the choice of a minimum graduation plan because it merely requires students to complete 22 credits in four-year and take 3 years of science, mathematics, social studies, and English as opposed to taking 4 years of each core subject as it is in other two plans. They feel that the minimum graduation plan runs counter to their mission of preparing students with a strong emphasis in mathematics, engineering, science and technology. They also offer a variety of computer and technology courses to accomplish this mission. For this reason we included computer course enrollment as a factor to investigate in our study.

We specifically focused on a charter school system because of their a) STEM focus (some of the campuses were categorized as STEM academies), b) convenient location, and (c) variety of computer course offerings for 9-12 grade students: Desktop publishing, web mastering, digital graphics and anima-

tion, video editing, game design, AP computer science and such.

Analyses

Before analyzing our data, we categorized student majors as STEM (0), non-STEM (1) majors, and undecided (2) according to the U.S. Immigration and Customs Enforcement's STEM-designated degree program list (U.S. Immigration and Customs Enforcement, 2011). The program list included 328 as STEM majors.

Data were analyzed using SPSS 20.0. Because dependent and independent variables were categorical, chi-square analyses were utilized to examine the relationship between AP enrollments, computer course enrollments, SAT reading, mathematics, and total scores and post-secondary major selection.

Findings

Descriptive statistics showed that this particular charter school system's students all graduated from their respective high schools and were admitted to a post-secondary institution. In terms of demographic characteristics, 96% of the males, 91% females, 92% of Hispanics, 100% African Americans, 88% of Whites, and 96% of the economically disadvantaged students were admitted to a 4-year college (see Table 3). The remainder participated in other post-secondary options. Among those, 54% of the males, 38% of females, 36% of Hispanics, 78% of African Americans, 56% of Whites, and 47% of economically disadvantaged students reported that they selected STEM majors at their 4-year colleges.

Table 3

College Matriculation of Demographics by Percent

	Male	Female	Hispanic	Black	White	ED
4-year	96	91	92	100	88	96
2-year	4	9	8	0	13	4
STEM Majors	54	38	36	78	56	47

After running chi-square analysis several times, we split SAT scores into two groups <500 and >500 because chi-square test results were meaningful using only two groups of individual SAT reading and SAT mathematics scores. A similar grouping was also used for composite and total SAT scores.

The first research question investigated whether there was a statistically significant relationship between SAT reading, SAT mathematics, SAT composite (reading + mathematics), and SAT total scores and students' preference of a STEM major. The chi-square measure indicated that there was a statistically significant relationship between students' SAT reading scores and their major choice (see Table 4). Even though students with higher (>500) SAT reading scores chose more STEM majors, this difference was not large (32 students chose STEM majors with higher scores, and 28 with lower scores).

On the other hand, there was not a statistically significant relationship between students' SAT mathematics scores and their major preferences (see Table 4). Nevertheless, it was clear that students with higher (>500) SAT mathematics scores (44) chose STEM majors much more frequently often than students with lower SAT mathematics scores (18).

The relationship between students SAT reading scores and their STEM major selection was statistically significant. Students with higher SAT scores (≥500) not only preferred more STEM majors but also seemed more determined on career selection with only 8 undecided students. So it is fair to say that the role of reading in any academic endeavor is immense.

Table 4: *Chi-Square Test Results for STEM Major Choice by SAT Reading, Mathematics, Composite, and Total Scores*

		STEM Major Choice				
		Non-STEM	STEM	Undecided	Total	x^2
SAT	≤500	12	28	25	65	
Reading-Score	≥500	21	32	8	61	$x^2(2)=15,98$, $p< .05$
Total		33	60	33	126	
SAT	≤500	9	16	12	37	
Math-Score	≥500	24	44	21	89	$x^2(2)=1.06$, $p>.05$
Total		33	60	33	126	
SAT	<1000	8	17	18	43	
Composite-Score	>1000	25	43	15	83	$x^2(2)=8.45$, $p< .05$
Total		33	60	33	126	
SAT	<1500	9	22	21	52	
Total-Score	>1500	24	38	12	74	$x^2(2)=10.00$, $p< .05$
Total		33	60	33	126	

Looking at the relationship between students' SAT composite scores and their college major selection, we found a statistically significant relationship between students with higher composite scores (43 students, reading + mathematics scores >1000) and STEM major choice (see Table 4).

We also examined the relationship between students' overall SAT scores and their choice of a college major. As presented in the Table 4, we found that students with higher total scores (38 students, >1500) chose STEM majors at a higher rate than those with lower total scores (22 students, 1500).

The second research question focused on the relationship between the number of AP mathematics, science, social studies, and AP courses taking and their STEM-related major choice. As presented in Table 5, the chi-square analysis results showed that there was not a statistically significant relationship between students' enrollment in AP mathematics and their STEM major selection. In fact, more students with no AP mathematics course (39) chose STEM majors more frequently than those with 1 AP (17) or 2 AP (7) mathematics course enrollments respectively. In other words, taking AP mathematics courses does not guarantee a student's STEM major preference. Similarly, although there was a statistically significant relationship between number of AP science course taken and choice of a STEM program, this was not a guaranteeing factor for a student to choose a STEM major because the number of students with zero AP science courses (31), 1 AP science course (23), and 2 AP science courses (12) were almost the same in terms of STEM major selection

Table 5: *Chi-Square Test Results for STEM Major Choice by # and Types of AP and Computer Course Enrollments*

		STEM Major Choice				
		Non-STEM	STEM	Undecided	Total	x^2
# of AP-Math Courses	0	24	39	30	93	
	1	9	17	7	33	$x^2(4)=2.80$, $p> .05$
	2	6	7	3	16	
Total		39	63	40	142	
# of AP-Science Courses	0	23	31	25	79	
	1	16	23	11	50	$x^2(4)=13.74$, $p< .05$
	2	0	12	1	13	
Total		39	66	37	142	
# of AP-Social Studies Courses	0	11	31	28	70	
	1	18	16	6	40	
	2	5	12	3	20	$x^2(6)=21.67$, $p< .05$
	3	5	7	0	12	
Total		39	66	37	142	
# of Total AP Courses	0	8	14	20	42	
	1	11	16	12	39	
	2	8	8	1	17	$x^2(6)=23.41$, $p< .05$
	3	12	28	4	44	
Total		39	66	37	142	
# of Computer Courses	0	9	7	2	18	
	1	12	27	12	51	
	2	9	13	12	34	$x^2(6)=7.93$, $p>.05$
	3	9	19	11	39	
Total		39	66	37	142	

In addition, we found that students with or without AP social studies courses chose STEM majors at similar rates (see Table 5) even though there was a statistically significant relationship between students' AP social studies enrollment and their major choice (see Table 5). Another interesting finding was that students with non-STEM majors with 1 or more AP social studies courses (28) were less than those of STEM majors with 1 or more AP social studies course (35). Thus, students with STEM major choices enrolled in more AP social studies courses than students with non-STEM majors.

The total number of AP courses taken was statistically significant. As students took

more AP courses regardless of course types, they were more likely to choose STEM majors. The importance of AP course taking was apparent when the total number of STEM major-choosing students (66) was compared with the total of non-STEM major-choosing (39) and undecided students (37) in terms of STEM major choice.

The last research question examined the relationship between the number of computer courses taken by students and their STEM major preference. Although

there was not a statistically significant relationship between these two factors, it was clear that students with a higher number of computer courses preferred STEM majors than the students who had enrolled in a lower number of computer course.

Discussion

In this study, we investigated three research questions. First, we examined the relationship between students' SAT reading, mathematics, composite, and total scores and their STEM major choices. We found that students' SAT reading, SAT composite, and SAT total scores had a statistically significant relationship with students' STEM major choice. It was interesting that students with higher (> 500) SAT reading scores (only 8 students) were less hesitant about what they wanted to do when they graduated from their high schools than those with low (<500) scores (25 students).

Even though there was not a statistically significant relationship between students' SAT mathematics scores, there was a pattern showing that students with higher SAT mathematics scores were more inclined to choose a STEM major. This was an expected finding because students with a high level of mathematics knowledge are more likely to prefer engineering, computer science, mathematics, and science majors than less quantitatively focused majors. SAT scores continued to be an important indicator not only for students' college successes but also for their selection of majors as found in previous research (Astin, 1993; Simpson, 2001).

We found that there was a statistically significant relationship between students SAT composite scores and their college major selection. This finding was consistent with the research stating that strong mathematics and reading scores are powerful indicators for success in 21st century professions (Jerald, 2009).

Examination of the relationship between students' overall SAT scores and their choice of a college major revealed that although there was not a statistically significant relationship but we detected that the number of students choosing non-STEM majors or undecided (24+12) was lower than the number of students choosing STEM majors (38) in terms of SAT total scores. This may indicate that students with higher SAT scores were more focused and inclined to choose STEM majors than other groups of students with lower scores.

Through the second research question, we examined the relationship between the number of AP science, mathematics and social studies courses taken by students and their selection of a STEM major. The study showed that there was a statistically significant relationship between the number of students' AP science and total AP courses and their STEM major selections. We also found that students who took a greater number of AP mathematics courses were more likely to pursue STEM-related majors. These findings were consistent with Robinson's 2002 and 2003 studies and the College Board's 2007 (Morgan & Klaric, 2007) findings that showed students who took AP calculus and AP science classes were more likely to chose majors such as science, engineering, mathematics, and the medicine.

The final research question addressed whether there was a significant difference between enrollment in computer courses and STEM major choices. In contrast to the expectation, there was no statistically significant difference. However, we did find that those who chose STEM majors enrolled in a

greater number of computer courses than those who did not choose a STEM major. This shows the relationship between the technology aspect of STEM and computer course enrollment.

The findings of this study supported previous research in terms of important roles of AP course taking, high college entrance exams scores (i.e. SAT), and technology-related course enrollment (computer courses) as it relates to students' STEM-related major selection (i.e. George-Jacson & Lichtenberger, 2012; Morgan & Klaric, 2007; Ma, 2011).

Further research may focus on including students' STEM-related career selections and how they differ by students' demographics (gender, ethnicity, and socio economic status) to determine if women and students of color still tend not to choose STEM majors in college

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Genişletilmiş Özet

Giriş

Üniversite eğitiminde fen, teknoloji, mühendislik ve matematik [STEM] (FTMM) alanlarının seçimine etkisi olan faktörlerin belirlenmesi yapılması gereken önemli çalışmalardır. Bu alanlara öğrenci seçiminde akademik hazırlanma ve ders katılımının önemli etmenler olduğu söylenebilir. Akademik hazırlanma deyince akla ilk olarak öğrencilerin daha lisedeyken aldıkları İleri Yerleştirme [AP] (GY) dersleri gelmektedir. Üniversiteye yerleşme sürecinde ise ülke genelinde yapılan yeterlilik sınavları, Bilimsel Yetenek Testi [SAT] (BYS) ve Amerikan Kolej Testi [ACT] (AKT) gibi standart haline getirilmiş testler kullanılmaktadır (George-Jacson & Lichtenberger, 2012). Bu araştırmanın amacı akademik hazırlık olarak tanımlanabilecek öğrencilerin lisede aldıkları İY, bilgisayar dersi ve ayrıca aldıkları standart test puanlarının FTMM alanında üniversiteye yerleştirme ile arasındaki ilişkileri belirlemektir.

Araştırma bulgularına göre, lisede daha fazla üniversiteye hazırlık amaçlı matematik ve fen dersleri alan öğrenciler üniversiteye giriş sınavlarında daha yüksek puan almaktadırlar (Brody & Benbow, 1990; McClure, 1998). Bu bakış acısından, lise yıllarında İY dersleri almanın ve standart sınavların puanlarının öğrencilerin eğitimlerindeki gelişimlerine ve dolayısıyla kariyer seçimlerine etki edip etmediği incelenmesi gereken bir konudur. Birçok unsur üniversitedeki FTMM alanlarına kabul edilmeyi etkilediği için, bu çalışmanın odak noktası olarak FTMM kariyer seçiminde en çok atıfta bulunulan unsurlar olan öğrencilerin akademik hazırlığı ve aldıkları dersler belirlenmiştir (George-Jacson & Lichtenberger, 2012; Ma, 2011).

Yöntem

Bu çalışmada tarama yöntemi kullanılmıştır. Veriler 2010-2011 eğitim yılında mezun olan toplam 149 kişiden çevrimiçi bir anket uygulanarak toplanmıştır. Bu öğrencilerin (n=149) mezuniyet durumları, demografik bilgileri (i.e., cinsiyet, etnik köken, sosyoekonomik seviye), alan seçimleri, BYS puanları ve İY derslerine katılımları ankette yer alan sorularla belirlenmiştir. Çalışmada 149 mezun öğrenciden gelen veriler incelenerek anketi yeterli şartlarda dolduran 126'sının bilgileri kullanılmıştır. Bütün öğrencilerin demografik bilgileri, mezuniyet durumları ve FTMM alan seçimleri demografiklerine göre tablo halinde gösterilmiştir (Bakiniz Tablo 2). İY katılımının, bilgisayar derslerine katilimin, üniversite eğitimindeki alan seçiminin ve BYS okuma puanı, matematik puanı ve toplam puanı arasındaki ilişkiyi incelemek için, SPSS 20.0 istatistik programı kullanılarak ki-kare analizi ve çapraz tablo analizleri yapılmıştır.

Bulgular ve Tartışma

İlk araştırma sorusu öğrencilerin BYS okuma, BYS matematik, BYS bileşik (okuma + matematik) ve BYS toplam puanları ile FTMM alan tercihleri arasında istatistiksel olarak anlamlı bir ilişki olup olmadığıdır. Ki-kare sonuçlarına göre, öğrencilerin BYT okuma puanları ile alan seçimleri arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur. Öğrencilerin BYS matematik puanları ile alan seçimleri arasındaki ilişki istatistiksel olarak anlamlı çıkmamasına rağmen, yüksek matematik puanlı öğrencilerin daha fazla FTMM bölümleri seçmeye eğilimli olduğu görülmüştür. Öğrencilerin toplam BYT puanları ile alan seçimleri arasındaki ilişki ise istatistiksel olarak anlamlı çıkmıştır.

İkinci araştırma sorusu öğrencilerin aldığı İY matematik, fen, sosyal bilimler derslerinin sayısı ve toplam İY ders sayısı ile FTMM alan tercihleri arasında ilişki olup olmadığıdır. Ki-kare analizleri öğrencilerin İY matematik derslerine katilimi ile FTMM alan seçimleri arasında istatistiksel olarak

anlamlı bir ilişki olmadığını göstermiştir. Diğer taraftan, öğrencilerin İY fen dersi sayıları ile alan seçimleri arasındaki bağlantı istatistiksel olarak anlamlı çıkmıştır. İlginçtir ki, öğrencilerin İY sosyal ders sayıları ile FTMM alan seçimleri arasındaki ilişki de anlamlı çıkmıştır. Ama daha dikkatli bakıldığında İY sosyal ders alan ya da almayan öğrencilerin benzer şekilde FTMM alanını seçtiği görülmüştür.

Son soru ise öğrencilerin aldığı bilgisayar derslerinin sayısı ile FTMM alan tercihleri arasında istatistiksel olarak anlamlı bir ilişki olup olmadığıdır. Bu iki değişken arasında istatistiksel olarak anlamlı bir ilişki olmamasına rağmen, çok sayıda bilgisayar dersi alan öğrencilerin daha az bilgisayar dersi alan öğrencilere oranla FTMM alanlarını daha fazla tercih etme eğiliminde oldukları görülmüştür.

Sonuç

Bu çalışmadaki bulgular İY derslerine katilimin, üniversite giriş sınavından alınan yüksek puanların (i.e., BYT puanları) ve bilgisayar dersi (i.e. bilgisayar dersi) almanın öğrencilerin FTMM alanını tercih etmelerinde rol oynayabileceğini göstermektedir. Ancak daha çok sayıda katılımcıyı içeren araştırma sonuçlarına gereksinim duyulmaktadır. Öğrencilerin İY derslerini ve bilgisayar derslerini almaya özendirilmesi ve bu dersleri alan öğrencilerin kariyer gelişimlerinin uzun vadeli incelenerek akademik sürecin kariyer gelişimine etkisini inceleyen kapsamlı araştırmaların yapılmasına gereksinim duyulmaktadır. İleride yapılacak çalışmalarda cinsiyet, sosyo-ekonomik düzey ve etnik köken gibi değişkenlerinde araştırma kapsamına alınması daha zengin bulgulara ulaşılmasını sağlayacaktır.