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Research Article

Investigation of Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies

Coğrafya Öğretmenlerinin Çevrimiçi Teknolojilere Yönelik Öz Yeterliliklerinin Belirlenmesi

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ABSTRACT

The goal of this study is to determine the s geography teachers' self-efficacy with regard to online technologies. Research data was collected from 68 geography teachers working in private and public schools in İzmir. As a measurement tool The Self-Efficacy Perception Scale for Online Technologies was used. The scale was developed by Miltiadou and Yu (2000) and adapted into Turkish by Horzum and Çakır (2009). The criteria based on self-efficacy measurements are aimed at measuring basic skills such as accessing desired web addresses, using e-mail tools, and participating in synchronous and asynchronous meetings. The research concludes that the internet skills of the geography teachers regarding online technologies were higher than their synchronous and asynchronous interaction skills. According to the data, the variables of gender, education levels, working hours, and school type, and graduated university did not result in a remarkable difference in self-efficacy perceptions of online technologies. According to the results of the study, it is recommended training programs are develpoed and carried out by determining the needs of teachers who will be using new technology tools in the future and to keep their self-efficacy of technology high.

Keywords: Online, technology, self-efficacy, geography teachers.

ÖZ

Bu çalışmanın amacı, coğrafya öğretmenlerinin çevrimiçi teknolojilere ilişkin öz-yeterliklerini belirlemektir. Araştırma verileri, İzmir ilinde özel ve devlet okullarında görev yapan 68 coğrafya öğretmeninden toplanmıştır. Ölçme aracı olarak Çevrimiçi Teknolojiler İçin Öz Yeterlik Algısı Ölçeği kullanılmıştır. Miltiadou ve Yu (2000) tarafından geliştirilen ölçek, Horzum ve Çakır (2009) tarafından Türkçe'ye uyarlanmıştır. Öz-yeterlik ölçümlerine dayalı kriterler, istenen web adreslerine erişme, e-posta araçlarını kullanma, eş zamanlı ve eşzamansız toplantılara katılma gibi temel becerileri ölçmeyi amaçlamaktadır. Araştırma coğrafya öğretmenlerinin çevrimiçi teknolojilere ilişkin internet becerilerinin senkron ve asenkron etkileşim becerilerine göre daha yüksek olduğu sonucuna varmıştır. Verilere göre cinsiyet, eğitim düzeyi, çalışma saatleri, okul türü ve mezun olunan üniversite değişkenleri çevrimiçi teknolojilere yönelik öz-yeterlik algılarında dikkate değer bir farklılığa yol açmamıştır. Araştırmanın sonuçlarına göre, gelecekte yeni teknoloji araçlarını kullanacak öğretmenlerin ihtiyaçlarının belirlenerek,

teknoloji öz-yeterliklerinin yüksek tutulması için eğitim programlarının geliştirilmesi ve yürütülmesi önerilmektedir.

Anahtar Sözcükler: Çevrimiçi, teknoloji, öz-yeterlik, coğrafya öğretmenleri.

INTRODUCTION

The rapid changes in the globalizing world are also seen in education and training activities. Especially due to the worldwide pandemic, the transition to applications in which technological infrastructures are used in many areas has become a necessity. Both the changes brought about by globalization and the difficulties experienced due to the pandemic have made it necessary for individuals to make use of the opportunities offered by technology. Changes in education processes require teachers to actively use information technologies in learning environments. As a result, teachers should acquire high self-efficacy for online technologies. Aşkar and Umay (2001) note that individuals with high self-efficacy beliefs in any subject show maximum efforts to complete a task, do not löse hope quickly with obstacles, and are motivated and tolerant. In this respect, it is important to know the up-to-date technological information and competences of teachers and to support them where there are deficiencies, and to conduct classroom teaching more effectively.

It is recommended to use technology in education systems by integrating it into curricula. Teachers' improved use of digital competency is one of the competencies in the Geography Lesson Curriculum (GLC), which was introduced in 2005 and revised in 2018. Basic skills, such as evaluating, storing, producing, presenting, sharing and connecting to common networks, and communicating over the internet, involve the safe and essential use of communication information and technologies for business, daily life, and communication (MEB, 2018).

Self-efficacy is described as perception or sense of efficiency in any issue, with its theoretical background based on Bandura's Social Cognitive Learning theory. Self-efficacy is a broad capability that includes cognitive, social, affective, and behavioral skills and has to be directed and structured to achieve wide range of goals (Bandura, 1997). As stated by Bandura, individuals whose self-efficacy perceptions are high have a similary high performance. Again, for Bandura (1995), people's perceptions of efficacy affect their way of thinking, feeling, motivating themselves, and behaviors. Horzum and Çakır (2009) associate the perception of self-efficacy in education with effort, persistence, and success.

Teachers play the most important role in eudcational processes and their perceptions of self-efficacy are important in the changing educational paradigm. It has been observed that educators who do not want to change the traditional education system, especially in regard to distance education processes experienced during the pandemic, have switched to completely online education (Dhawan, 2020). In addition, personal opinions, self-efficacy perceptions, and perspectives about their own capabilities all contribute in teaching educators and teacher candidates as well as in overcoming problems encountered during the teaching process (Yeşilyurt, 2013). According to studies on self-efficacy in the literature, teachers who reveal poor self-efficacy experience more work-related stress and exhaustion than educators who have high self-efficacy (Huber, Fruth, Avila-John, & López-Ramírez, 2016). In addition, teachers with a strong feeling of self-efficacy are eager to try out various teaching strategies and tools (Henson, 2001). Beliefs in teacher self-efficacy also predict pupil achievement and beliefs in various fields and levels (Pajares, 2002).

One study on self-efficacy and innovative work behaviors revealed that secondary school teachers with high self-efficacy exhibit higher innovative behaviors in their workplaces and that one of the most important ways to increase innovative work behaviors is to develop self-efficacy (Hsiao, Chang, Tu, & Chen, 2011). Also teachers who believe they have high self-efficacy seem

to be more ready to try out new ways of doing things and are ready to experiment different techniques to better meet the requirements of their pupils (Tschannen-Moran & Woolfolk Hoy, 2001). Another study found that self-efficacy of computer teacher candidates' for computer teaching and their self-efficacy for online technologies were moderately related (Sancar and Deryakulu, 2017). Some studies also revealed a strong linear association between the perceptions of self-efficacy of prospective teachers at universities towards technological norms in education and their public presence grades towards e-learning contexts (Ercan, Sağır, Mutluay, Şimşek, Başaran, Baysal, & Doğruluk, 2017). This research focuses on examining the perception of self-efficacy of geography teachers towards digital technologies.

1.1 Purpose of the Research

Examining geography instructors' self-efficacy perspectives of online technologies is the aim of this study. According to this objective, it was attempted to find responses to the following study questions:

I. What is the level of self-efficacy perception of geography teachers towards online technologies?
II. Do geography teachers' self-efficacy perceptions towards online technologies differ according to gender?
III. Do geography teachers' self-efficacy perceptions towards online technologies differ according to education levels?
IV. Do geography teachers' self-efficacy perceptions for online technologies differ according to years of service?
V. Do geography teachers' self-efficacy perceptions towards online technologies differ according to the school type they work in?
VI. Do geography teachers' self-efficacy perceptions towards online technologies differ according to the university they graduated from?

METHOD

This study uses the cross-sectional survey method to investigate the geography teachers' self-efficacy perceptions towards online technologies. This method is used for research that involves observing a situation over a certain time period (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2013).

The study attemtps to examine the self-efficacy sense of geography teachers towards online technologies according to gender, education level, service years , school they work in, and the university from which they graduated.

2.1. The Research Study Group

The research group consisted of geography teachers serving in private and public schools in Izmir. In the study, the questionnaire was completed voluntarily by all 68 participants. The questionnaire was delivered to the participants via Google forms. Table 1 displays the characteristics of the instructors who participated the study.

Table 2. Distribution of Gender

Gender	F	%
Female	45	66.2
Male	23	33.8
Total	68	100.0

Table 1 shows that the participants consisted of 45 women and 23 men. Geography teachers constitute the entire group with 68 participants in total.

2.2. Data Collection Tools

Data was obtained using Online Technologies Self-Efficacy Perception Scale. It has a four factor structure a result of exploratory factor analysis and confirmatory factor analysis.

The first factor in the scale, "Internet Skills", has nine items, the second factor, "Synchronous Interaction" has four items, the third factor, "Asynchronous Interaction I", consists of nine items, and the fourth factor, "Asynchronous Interaction II", consists of seven items. The scale is in 4-point Likert type. The reliability analysis results of the scale are presented in Table 2 (Yıldız and Seferoğlu, 2020).

Table 2. Reliability Values of Self-Efficacy Perception Scale Factors for Online Technologies

Factors	Cronbach Alfa
Internet Skills	.92
Synchronous Interaction	.87
Asynchronous Interaction I	.95
Asynchronous Interaction II	.94

The Cronbach Alpha internal consistency coefficient, which was checked for reliability, was found to be 0.947. Table 2 shows the reliability values of the sub-factors. The reliability value of the internet skills factor formed by the first ten statements in the questionnaire is 0.92, the reliability value of the statements 10, 11, 12 and 13 that constitute the synchronous interaction factor is 0.87, the reliability value of the statements from 14 to 22 that constitute the asynchronous interaction factor I is 0.95, and the reliability value of the asynchronous interaction II factor was presented as 0.94.

2.3. Data Analysis

The obtained data was analyzed with the Spss 23 program. Statistically, it has been handled within the scope of descriptive and inferential statistics. In this context, demographic evaluations were first made about the participants and this data is presented in tables. The reliability of the data was tested with Cronbach Alpha. Then, statements given by the participants regarding the research questions were examined. For this purpose, Mann Whitney U analysis was used to examine if the self-efficacy perception scores of geography teachers for online technologies changed according to gender. The K.Wallis Test was used to examine whether it changed in terms of education level, working hours, type of school, and graduated university. The reason for using the Mann Whitney U and K.Wallis is that the groups do not show normal distribution (Yıldız and Seferoğlu, 2020).

FINDINGS

This section presents the evaluations which were made in response to the study's sub-questions.

3.1. Self-Efficacy Perceptions of Geography Teachers towards Online Technologies

The first sub-question was "What is the self-efficacy perception of geography teachers towards online technologies?". Descriptive analysis was applied to examine and evaluate this question. The distribution of the answers received from the participants according to the sub-factors was evaluated with ($\bar{X}$) arithmetic mean scores and (Ss) standard deviation scores. Table 3 displays these results.

Table 3. Distribution of Arithmetic Mean and Standard Deviation Values of Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies

Factors	($\bar{X}$)	Ss
Internet Skills	4.63	.79
Synchronous Interaction	4.30	.90
Asynchronous Interaction I	4.59	.84
Asynchronous Interaction II	4.21	.99
Scale Overall	4.43	.88

According to the Table 3, the general average value of the participants' perceptions is 4.43 and the standard deviation value is 0.88. Considering that the mean value is measured with a 4-point Likert type scale, it has a high mean value. In the distribution of the scale's sub-factors, the areas with the highest self-efficacy were determined as Asynchronous interaction I factor and Internet Skill factor, respectively.

3.2. Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies by Gender

The second sub-question was "Does the self-efficacy perceptions of geography teachers towards online technologies differ according to gender?" The analysis used to answer to this was normality distribution. As the groups did not have a normal distribution, they could not meet the assumptions of the parametric test. Because the data was not normally distributed, the Mann-Whitney U test was applied to compare the two groups.

The Mann-Whitney U result was applied to reveal if there was a significant difference in Internet Skills, Simultaneous Interaction, Asynchronous Interaction I, and Asynchronous Interaction II between men and women in a group of 68 people consisting of 45 female and 23 male geography teachers. There was no statistically remarkable difference between self-efficacy perceptions for online technologies and men's self-efficacy sense for online Technologies (U=461,5 p>0,05). The evaluation result is shown in Table 4.

There was no remarkable effect on self-efficacy sense of online technologies according to gender.

Table 4. Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies Differentiation by Gender

Gender	N	Rank Average	U	P
Female	45	33.26	461,500	0.465
Male	23	36.93		
Total	68			

*p ≤.05 is significant.

3.3. Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies by Educational Levels

The third sub-question of the study was "Does geography teachers' self-efficacy perceptions towards online technologies differ according to education level?" Normality distribution was used to decide on the analysis used to answer this question. Since the groups did not show a normal distribution, they did not meet the assumptions of the parametric test. The

K.Wallis was used to assess the difference between more than two groups because the data was not normally distributed (Yıldız and Seferoğlu, 2020) (see Table 5).

Table 5. The Differences in Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies by Educational Level

Educational Level	N	Rank Average	X^2	Sd	P	Significant Difference
Bachelor	52	34.09	1.846	2	0.397	
Graduate	15	34.17				
Doctorate	1	61.00				

*p ≤.05 is significant.

As the p value is greater than 0.05 as a result of the K.Wallis test, the hypothesis that there is no significant difference between the level of education and self-efficacy perceptions for online technolgies was accepted.

3.4. Self-Efficacy Perceptions of Geography Teachers towards Online Technologies by Working Hours

The fourth sub-question of the study was "Does geography teachers' self-efficacy perceptions towards online technologies differ according to working hours?" Normality distribution was used to decide the analysis used to answer this question. Since the groups did not show a normal distribution, they could not meet the assumptions of the parametric test. The K.Wallis test was applied to see the difference between more than two groups because the data was not normally distributed (see Table 6).

Table 6. Differences in Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies by Years of Service

Years of Service	N	Rank Average	X^2	sd	P	Significant Difference
1-5 Years	5	30.30	1.731	4	0.785	
6-10 Years	11	39.59				
11-15 Years	10	30.45				
16-20 Years	13	32.00				
21 and more	29	35.81				
Total	68					

*p≤ .05 is significant.

As a result, it was hypothesized that there was no significant difference in perceptions of self-efficacy since the p value was greater than 0.05.

Considering the averages of the rankings, on the basis of the points, teachers' self-efficacy who have worked for 21 years or more is higher than the other groups on the basis of points.

3.5. Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies According to the School They Work In

The fifth sub-question of the research is "Does geography teachers' self-efficacy perceptions towards online technologies differ according to the school type they work in?" Normality distrubition was used to decide on the analysis used to answer to this question. Since the groups did not show a normal distribution, they could not meet the assumptions of the

parametric test. Because the data was not normally distributed, the K.Wallis test was applied to test the difference between more than two groups (see Table 7).

Table 7. Geography Teachers' Perceptions of Self-Efficacy towards Online Technologies According to Type of School

Type of School	N	Rank Average	X^2	Sd	p	Significant Difference
Anatolian High School	52	34.12	0.411	2	0.814	
Religious Vocational High School	15	31.12				
Vocational High School	1	37.23				

*p≤ .05 is meaningful.

Since the p value is greater than 0.05 according to the result of the K.Wallis test, the hypothesis that there is no significant difference between the type of school and self-efficacy perceptions for online technologies was accepted.

3.6. Self-Efficacy Perceptions of Geography Teachers towards Online Technologies by University of Graduation

The sixth sub-question was "Does the self-efficacy perceptions of geography teachers towards online technologies differ according to the university they graduated from?" Normality distrubition was used to decide on the analysis used to answer this question. Since the groups did not show a normal distribution, they could not meet the assumptions of the parametric test. As the data was not normally distributed, the K.Wallis test was applied in order to find out the difference between more than two groups (see Table 8).

Table 8. Self-Efficacy Perceptions of Geography Teachers towards Online Technologies by University of Graduation

University of Graduation	N	Rank Average	X^2	Sd	p	Significant Difference
İstanbul Uni.	5	38.00	20.970	16	0.181	
19 Mayıs Uni.	5	43.20				
9 Eylül Uni.	13	29.69				
Ankara Uni.	1	18.50				
Atatürk Uni.	2	61.00				
Balıkesir Uni.	9	36.06				
18 Mart Uni.	1	47.50				
Dicle Uni.	3	24.50				
Ege Uni.	16	36.28				
Gazi Uni.	3	3.33				
Hacettepe Uni.	1	30.50				
Kahramanmaraş Sütçü İmam Uni.	1	61.00				
Karadeniz Teknik Uni.	2	17.25				
Marmara Uni.	1	61.00				
Süleyman Demirel Uni.	1	47.50				
Selçuk Uni.	3	37.50				
Yüzüncü Yıl Uni.	1	30.50				
Total	68					

*p≤ .05 is meaningful.

Since the p value is greater than 0.05 as a result of the K.Wallis test, the hypothesis that there is no significant difference between the University of Graduation and self-efficacy perceptions for online technologies was accepted. Considering the averages of the rankings, it is seen that the teachers' self-efficacy scores who graduated from Marmara, Kahramanmaraş Sütçü İmam and Atatürk universities are higher.

CONCLUSION AND RECOMMENDATIONS

The study shows that gender did not have a significant effect on self-efficacy perceptions for online technologies. The obtained finding is also similar to various studies in the literature (Üstüner et al, 2009; Barut, 2015; Yıldız, 2016; Ülkü 2018).

According to the research findings, no remarkable difference between the geography teachers' education levels and their self-efficacy perceptions towards online Technologies was determined.

According to the data regarding years of service, there was no significant difference between service years and self-efficacy perceptions of online technologies. Considering the averages of the rankings, we can say that the self-efficacy of the teachers with 21 years and over service years is higher than the other groups on the basis of points. A study by Lee and Tsai (2010) revealed that as the tenure of teachers increases, their self-efficacy perceptions increase. Bahar, Uludağ, and Kaplan (2009) conclude that there is no significant relationship between educators' seniority and their attitudes towards computers.

The analysis to see if the geography teachers' self-efficacy perceptions towards online technologies differ according to the school type shows there is no significant difference between the school at which they work and their self-efficacy perceptions towards online technologies. In his study, Yılmaz (2012) concludes that the attitudes of vocational course teachers towards the implementaton of technology in education are more strong than the culture course teachers, according to the findings on the basis of branches.

The analysis of geography teachers' self-efficacy perceptions towards online technologies according to the university they graduated from reveals that there is no significant difference between the university of graduation, their perception of self-efficacy towards online technologies.

In this context, it would be beneficial for the studies conducted on online technologies in the literature to focus on aspects other than those of the current findings. Scale studies related to the subject reorganize teachers' self-efficacy more precisely in line with technologies that youth are interested in.

Studies carried out on technology acceptance and self-efficacy perceptions of geography teachers could try to measure their competence in programs used for transferring their field knowledge to students. According to the findings of the study field teachers can benefit from in-service training and programs can be organized for.

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GENİŞLETİLMİŞ ÖZ

Giriş

Küreselleşen dünyada yaşanan hızlı değişimler eğitim ve öğretim faaliyetlerinde de kendini göstermektedir. Hem küreselleşmenin getirdiği değişimler hem de pandemi nedeniyle yaşanan zorluklar bireylerin teknolojinin sunduğu olanaklardan faydalanabilmesini zorunlu kılmıştır. Eğitim-öğretim süreçlerinde yaşanan değişimler öğretmenlerin öğrenme ortamlarında bilgi teknolojilerini aktif olarak kullanmasını gerektirmektedir.

Bu araştırmada coğrafya öğretmenlerinin çevrim içi teknolojilere yönelik özyeterlilikleri incelenmiştir. Katılımcıların internet becerileri, eş zamanlı ve eş zamansız görüşmeler gerçekleştirebilme yeterlilikleri araştırılmıştır.

Araştırmada coğrafya öğretmenlerinin özyeterlilik düzeylerinin cinsiyet, öğrenim düzeyleri, çalışma süreleri, görev yaptıkları okul türü ve mezun olunan üniversite değişkenlerine göre farklılık gösterip göstermedikleri incelenmiştir.

Yöntem

Coğrafya öğretmenlerine yönelik yapılan çalışmada kesitsel tarama yöntemi kullanılmıştır. Bu yöntem; örneklemin belirli bir zaman dilimi içerisindeki durumunu gözlemlemeyi içeren araştırmalar için kullanılır (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2013). Bu araştırmada öğretmenlere ait veriler İzmir ili içerisinde özel ve devlet okullarında görev yapmakta olan 68 coğrafya öğretmenlerinden hazır bir ölçek aracılığı ile toplanmıştır[*]. Anket ölçeği 29 maddeden oluşturulmuştur. Ölçek 4'lü likert tipindedir. Anket katılımcılara Google form aracılığı ile iletilmiştir. Google form ile ulaşılan veriler Spss programı yardımı analiz edilmiştir.

Çalışmada öz yeterlik algı puanlarının; cinsiyet değişkeninde farklılık gösterip göstermediğini Mann Whitney U analizi, öğrenim düzeyleri, çalışma süreleri, görev yapılan okul türü, mezun olunan okula göre değişip değişmediğinin belirkenmesi amacıyla da K.Wallis testi kullanılmıştır. Mann Whitney U ve K.Wallis testlerinin kullanılmasının nedeni grupların normal dağılım göstermemesidir (Yıldız ve Seferoğlu, 2020).

Bulgular

Çalışman verilerinin değerlendirilmesi sonucunda; birinci alt problemi oluşturan, coğrafya öğretmenlerinin çevrim içi öz yeterlilik algılarının genel ortalama değeri 4.43, standart sapma değeri 0.88'dir. Ortalama değerinin 5'li likert tipi ölçek ile ölçüldüğü göz önüne alındığında, yüksek bir otalama değeri olduğu görülmektedir.

Araştırmanın ikinci problemine yönelik elde edilen sonuçlar incelendiğinde, coğrafya öğretmenlerinin öz yeterlik algılarının kadın ve erkek değişkeninde anlamlı farklılık oluşturmadığı görülmüştür ($U=461{,}5$ $p>0{,}05$).

Araştırmanın diğer alt problemleri coğrafya öğretmenlerinin çevrim içi teknolojilere yönelik öz yeterlik algılarının öğrenim düzeyleri, çalışma süreleri, görev yapılan okul türü,

[*] Ölçme aracı: Miltiadou ve Yu (2000) tarafından geliştirilen; Horzum ve Çakır (2009) tarafından Türkçe'ye uyarlanan "*Çevrim İçi Teknolojilere Yönelik Öz yeterlik Algısı Ölçeği*"dir.

mezun olunan okula göre durumlarını sorgulamıştır. K.Wallis testleri sonucunda p değerlerinin 0,05'ten büyük olmasından dolayı analizlerde sıfır hipotezi (h_0) kabul edilmiştir.

Tartışma ve Sonuç

Genel olarak bu araştırma sonuçları, coğrafya öğretmenlerinin çevrimiçi teknolojiler konusundaki öz yeterlik algılarının yüksek olduğu ve gruplar arasında değişkenlere göre farklar olmadığını sonucuna ulaşmıştır.

Bu bağlamda, alan yazında çevrim içi teknolojilere yönelik olarak yapılacak araştırmaların mevcut tespitlerden farklı çalışmalara yönelmesinin yararlı olacağı söylenebilir. Konu ile ilişkili ölçek çalışmalarının çağın gençlerinin ilgi duyduğu teknolojiler doğrultusunda öğretmenlerin özyeterliliklerini daha hassas şekilde yeniden düzenlenmesi düşünülebilir.